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**DRINKING WATER SURVEILLANCE PROGRAM**

**DRESDEN  
WATER TREATMENT  
PLANT**

**REPORT FOR 1991 AND 1992**



ISSN 0839-8984

**DRESDEN WATER TREATMENT PLANT  
DRINKING WATER SURVEILLANCE PROGRAM  
REPORT FOR 1991 AND 1992**

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## EXECUTIVE SUMMARY

### DRINKING WATER SURVEILLANCE PROGRAM

#### DRESDEN WATER TREATMENT PLANT 1991 AND 1992 REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

The Dresden water treatment plant is a conventional treatment plant which treats water from the Sydenham River. The process consists of coagulation, flocculation, clarification (upflow clarifier), filtration and disinfection. Powder activated carbon is applied for taste and odour control and pesticide reduction. This plant has a rated capacity of  $2.3 \times 1000 \text{ m}^3/\text{day}$ . The Dresden water treatment plant serves a population of approximately 2,500.

Water at the plant and at two locations in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

Table A is a summary of all results by group.

No known health related guidelines were exceeded.

The Dresden water treatment plant, for the sample years of 1991, and 1992, produced acceptable quality water and this was maintained in the distribution system.

TABLE A  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE  
A '-' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	SITE	RAW				TREATED				MOONEY ST				RICHMOND ST			
		TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	
BACTERIOLOGICAL		33	27	81	11	4	36	12	5	41	4	1	25				
CHEMISTRY (FIELD)		29	29	100	56	56	100	138	126	91	48	44	91				
CHEMISTRY (LABORATORY)		282	270	95	286	234	81	503	466	92	168	157	93				
METALS		288	160	55	288	132	45	552	300	54	184	105	57				
CHLOROCARBONICS		140	0	0	112	0	0	140	1	0	42	0	0				
CHLOROPHENOLS		24	0	0	24	0	0	0	0	0	0	0	0				
PESTICIDES AND PCB		335	3	0	265	3	1	220	1	0	67	0	0				
PHENOLICS		12	0	0	12	1	8	0	0	0	0	0	0				
POLYAROMATIC HYDROCARBONS		68	0	0	51	0	0	68	0	0	51	0	0				
SPECIFIC PESTICIDES		93	1	1	73	0	0	1	0	0	1	0	0				
VOLATILES		360	0	0	360	48	13	360	48	13	116	16	13				
RADIONUCLIDES		28	8	28	28	8	28	0	0	0	0	0	0				
TOTAL		1,692	498		1,566	486		1,994	947		681	323					

## **DRINKING WATER SURVEILLANCE PROGRAM**

### **DRESDEN WATER TREATMENT PLANT 1991 AND 1992 REPORT**

#### **INTRODUCTION**

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the Dresden water treatment plant in the spring of 1985 as part of the alachlor pesticide study conducted in the Southwestern Region. Previous annual reports have been published for 1986, 1987, 1988, 1989 and 1990.

#### **PLANT DESCRIPTION**

The Dresden water treatment plant is a conventional treatment plant which treats water from the Sydenham River. The process consists of coagulation, flocculation, clarification (upflow clarifier), filtration and disinfection. Powder activated carbon is applied for taste and odour control and pesticide reduction. This plant has a rated capacity of  $2.3 \times 1000 \text{ m}^3/\text{day}$ . The Dresden water treatment plant serves a population of approximately 2,500.

The sample day flows ranged from  $0.11 \times 1000 \text{ m}^3/\text{day}$  to  $6.7 \times 1000 \text{ m}^3/\text{day}$ .

General plant information is presented in Table 1 and a schematic of plant processes, chemical addition points and sampling locations in Figure 1.

#### **SAMPLING AND ANALYSES**

Stringent DWSP sampling protocols were followed to ensure that all samples were collected in a uniform manner (see Appendix B).

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. Retention time was calculated by dividing the volume of water between two sampling points by sample day flow. For example, if it was determined that retention time within the plant was five hours, then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

To obtain a representative raw water sample, free from any added chemicals, at plants which used chlorine for zebra mussel control, the operator was required to turn off the chlorine feed to the mouth of the intake and allow enough time for the chlorinated water to clear from the intake works.

Plant operating personnel routinely analyzed parameters for process control (Table 2).

At all distribution system locations, two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples, therefore, were laboratory chemistry and metals. The free flow sample represented fresh water from the distribution system main, since the sample tap was flushed for five minutes prior to sampling.

Water at the plant and at two locations in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

## RESULTS

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 contains information on delay time between the raw and treated water sampling, flow rate, and treatment chemical dosages.



Table 4 is a summary of all results by parameter and by water type. If a parameter was not detected, the total number of negative sample results is given. In contrast, if a parameter was detected at any location, the detailed results for all samples are provided.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment and Energy laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 4 and 5. Parameters are listed alphabetically within each scan.

## DISCUSSION

### GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). These objectives are applied to free flowing water. When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

The guidelines are evaluated on the results from the free flowing samples. Standing samples in the distribution system can show elevated concentrations in certain metals if the water is corrosive or if the standing time is excessive. Flushing the tap until the water achieves the coolest temperature will ensure that the water used for consumption will contain minimum concentrations of metals.

IN THIS REPORT, DISCUSSION IS LIMITED TO:

- THE TREATED AND DISTRIBUTED WATER;
- ONLY THOSE PARAMETERS WITH CONCENTRATIONS ABOVE  
GUIDELINE VALUES; AND
- POSITIVE ORGANIC PARAMETERS DETECTED.

### BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples. Standard plate count was the only bacteriological analysis conducted on the treated and distributed water.

Standard plate count is a test used to supplement routine analysis for coliform bacteria. The limit for standard plate count (at 35°C after 48 hours) in the ODWOs is 500 counts/mL (based on a geometric mean of 5 or more samples). DWSP bacteriological analysis of treated and distributed water was limited to standard plate count.

Standard plate count (membrane filtration) exceeded the ODWO Aesthetic Objective of 500 counts/mL in 5 of 27 treated and distributed water samples with a maximum reported value of >2,400 counts/mL.

## INORGANIC & PHYSICAL

### CHEMISTRY (FIELD)

It is desirable that the temperature of drinking water be less than 15°C. The palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of delivered water may increase in the distribution system due to the warming effect of soil in late summer and fall and/or as a result of higher temperatures in the source water.

Field temperature exceeded the ODWO Aesthetic Objective of 15°C in 7 of 26 treated and distributed water samples with a maximum reported value of 22.5°C.

### CHEMISTRY (LABORATORY)

Calcium exceeded the European Economic Community Aesthetic Guideline Level of 100 mg/L in 8 of 28 treated and distributed water samples with a maximum reported value of 106.7 mg/L.

Colour in drinking water may be due to the presence of natural or synthetic substances as well as certain metallic ions. Colour is measured in Hazen units (HZU).

Colour exceeded the ODWO Aesthetic Objective of 5 HZU in 18 of 28 treated and distributed water samples with a maximum reported value of 14.0 HZU.

Elevated conductivity is often associated with high hardness levels.

Conductivity exceeded the European Economic Community Aesthetic Guideline Level of 400 umho/cm in all 28 treated and distributed water samples with a maximum reported value of 743 umho/cm.

The ODWOs indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable

balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and possess a tendency to form scale deposits and result in excessive soap consumption.

Hardness exceeded the ODWO Recommended Operational Guideline of 80-100 mg/L and also exceeded 200 mg/L in all 28 treated and distributed water samples with a maximum reported value of 342.0 mg/L.

Turbidity in water is caused by the presence of suspended matter such as clay, silt, colloidal particles, plankton and other microscopic organisms. The most important potential health effect of turbidity is its interference with disinfection in the treatment plant and the maintenance of a chlorine residual. The ODWO Maximum Acceptable Concentration for turbidity is 1.0 Formazin Turbidity Unit (FTU) and applies to the water leaving the treatment facility.

Turbidity exceeded the ODWO Maximum Acceptable Concentration of 1.0 FTU in 1 treated water sample with a maximum reported value of 1.08 FTU. This result was not confirmed by the corresponding and more reliable field turbidity result.

#### METALS

At present, there is no evidence that aluminum is physiologically harmful and no health limit for drinking water has been specified. The measure of aluminum in treated water is important to measure the efficiency of the treatment process. The ODWOs indicate that a useful guideline is to maintain a residual below 100 ug/L as aluminum in the water leaving the plant to avoid problems in the distribution system.

Aluminum exceeded the ODWO Recommended Operational Guideline of 100 ug/L in 7 of 28 treated and distributed water samples with a maximum reported value of 960 ug/L.

Manganese, in high concentrations, can contribute to laundry staining and undesirable tastes.

Manganese exceeded the ODWO Aesthetic Objective of 50.0 ug/L in 1 of 28 treated and distributed water samples with a maximum reported value of 320.0 ug/L.

#### ORGANIC

##### CHLOROAROMATICS

Hexachloroethane was found at a positive level in 1 of the 21 treated and distributed water samples analyzed. The maximum observed level was 12.0 ng/L. This was below the United States

Environmental Protection Agency Ambient Water Quality Criteria of 1,900 ng/L.

#### CHLOROPHENOLS

The results of the chlorophenol scan showed that none were detected above trace levels.

#### PESTICIDES AND PCB

Atrazine was found at positive levels in 3 of the 8 treated water samples analyzed. The maximum observed level was 850 ng/L. This was below the ODWO Interim Maximum Acceptable Concentration of 60,000 ng/L.

Other pesticides detected at trace levels included desethyl atrazine; metolachlor, cyanazine (bladex), metribuzin (sencor), and simazine. The dosage of powder activated carbon was not sufficient to reduce pesticide concentrations in the treated water.

Hexachlorocyclopentadiene was found at a positive level in 1 of the 8 treated and distributed water samples analyzed. The maximum observed level was 67.0 ng/L. This was below the United States Environmental Protection Agency Ambient Water Quality Criteria of 206,000 ng/L.

#### PHENOLICS

Phenolic compounds are present in the aquatic environment as a result of natural and/or industrial processes. The ODWOs have been revised to replace the aesthetic phenolic objective with objectives for specific phenols.

Phenolics were found at a positive level in 1 of the 12 treated water samples analyzed. The maximum observed level was 2.8 ug/L.

#### POLYAROMATIC HYDROCARBONS

The results of the polyaromatic hydrocarbon scan showed that none were detected.

#### SPECIFIC PESTICIDES

The results of the specific pesticide scan showed that three parameters, 2,4-D, 2,4-D propionic acid and dicamba were detected at trace levels.

#### VOLATILES

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology. Trace levels of styrene are considered to

be laboratory artifacts resulting from the sample shipping containers.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and dichlorobromomethane. Bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. Only total THM results are discussed. Starting in 1991, samples from the distribution system were quenched with sodium thiosulphate to stop the further production of THMs in the sample bottle. This provided a more representative estimation of the THMs consumed in tap water.

Total trihalomethanes were found at positive levels in all 28 treated and distributed water samples analyzed with a maximum level of 117.6 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

## RADIOLOGICAL

### RADIONUCLIDES

There are more than 200 radionuclides, some of which occur naturally and others which originate from the activities of society. The radionuclides currently of greater interest from a health view-point are tritium, strontium-90, iodine-131, cesium-137 and radium-226. The gross beta and gross alpha determinations are suitable for preliminary screening except for tritium which must be measured separately. Radionuclides are measured in becquerels per litre (Bq/L). No results were above the available guidelines.

## CONCLUSIONS

The presence of a number of pesticides which were detected at the Dresden water treatment plant indicates that this raw water source is adversely affected by agricultural activity. The addition of powder activated carbon at increased dosages are required to adequately reduce the levels of these contaminants.

The results are similar to those found in previous years.

No known health related guidelines were exceeded.

The Dresden water treatment plant, for the sample years of 1991, and 1992, produced acceptable quality water and this was maintained in the distribution system.



FIGURE 1

# DRESDEN WATER TREATMENT PLANT

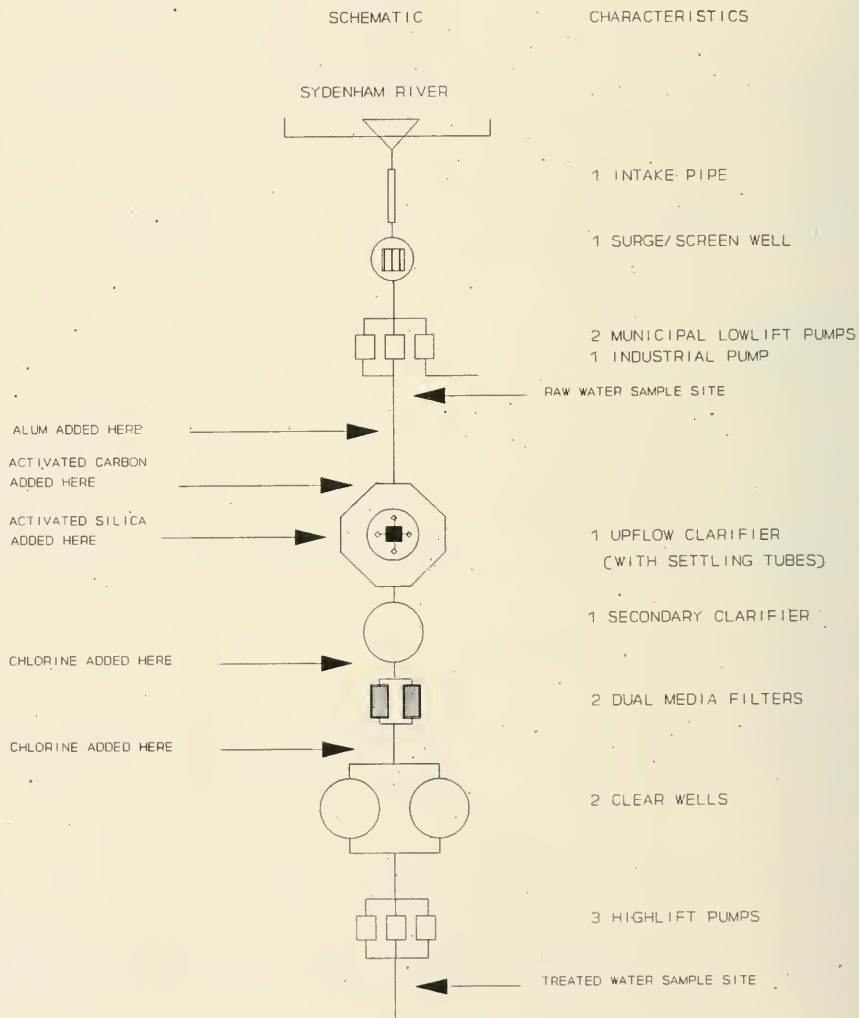


TABLE 1  
DRINKING WATER SURVEILLANCE PROGRAM  
PLANT GENERAL REPORT

PLANT NAME: DRESDEN WTP  
WORKS #: 210000283  
UTM #: 174038604715670

DISTRICT: SARNIA  
REGION: SOUTHWEST  
DISTRICT OFFICER: O. WIGLE

SUPERINTENDENT: CHUCK SHERMAN

ADDRESS: 749 PEEL ST. P.O. BOX 1120  
DRESDEN, ONTARIO  
NOP 1M0  
519-683-6103

MUNICIPALITY: DRESDEN  
AUTHORITY: PROVINCIAL

PLANT INFORMATION

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PLANT VOLUME:	0.581	(X 1000 M3)
DESIGN CAPACITY:	3.819	(X 1000 M3/DAY)
RATED CAPACITY:	2.374	(X 1000 M3/DAY)

MUNICIPALITY  
-----  
CANADIAN CANNERS  
DRESDEN

POPULATION  
-----  
N/A  
2,477

TABLE 2  
DRINKING WATER SURVEILLANCE PROGRAM  
IN-PLANT MONITORING

PARAMETER -----	LOCATION -----	FREQUENCY -----
COMBINED CHLORINE RESIDUAL	FILTERED	4 TIMES/DAY
FREE CHLORINE RESIDUAL	TREATED	4 TIMES/DAY
TEMPERATURE	RAW	DAILY READING
TURBIDITY	LAB RAW	DAILY READING
	RAW	DAILY READING
	TREATED	3 TIMES/DAY



TABLE 3  
DRINKING WATER SURVEILLANCE PROGRAM DRESDEN WTP SAMPLE DAY CONDITIONS  
AND TREATMENT CHEMICAL DOSAGES FOR 1991 AND 1992

DATE	DELAY * TIME(HRS) (1000H3)	COAGULATION ALUM LIQUID	COAGULATION AID SODIUM SILICATE	TASTE & ODOR ACTIVATED CARBON POWDER	ACTIVATION SODIUM BICARBONATE	POST CHLORINATION CHLORINE
91 FEB 12	.00	6.775	7.30	-	6.30	4.08
91 APR 09	.00	4.110	9.48	-	-	4.54
91 JUN 10	.50	-	8.61	-	-	5.44
91 OCT 16	-	-	-	-	21.54	4.54
91 NOV 19	.00	1.710	-	-	18.18	3.17
92 FEB 18	.00	1.990	9.40	-	8.10	2.05
92 JUN 10	.50	2.270	10.40	-	9.00	2.69
92 OCT 14	.00	2.533	7.20	-	7.20	1.45
92 DEC 08	.00	2.109	5.00	1.00	4.30	1.94

\* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

KEY TO TABLE 4 and 5

- A ONTARIO DRINKING WATER OBJECTIVES (ODWO)  
1. Maximum Acceptable Concentration (MAC)  
1+. MAC for Total Trihalomethanes  
2. Interim Maximum Acceptable Concentration (IMAC)  
3. Aesthetic Objective (AO)  
3\*. AO for Total Xylenes  
4. Recommended Operational Guideline  
5. Health Related Guidance Value
- B HEALTH & WELFARE CANADA (H&W)  
1. Maximum Acceptable Concentration (MAC)  
2. Proposed MAC  
3. Interim MAC  
4. Aesthetic Objective (AO)
- C WORLD HEALTH ORGANIZATION (WHO)  
1. Guideline Value (GV)  
2. Tentative GV  
3. Aesthetic GV
- D US ENVIRONMENTAL PROTECTION AGENCY (EPA)  
1. Maximum Contaminant Level (MCL)  
2. Suggested No-Adverse Effect Level (SNAEL)  
3. Lifetime Health Advisory  
4. EPA Ambient Water Quality Criteria
- F EUROPEAN ECONOMIC COMMUNITY (EEC)  
1. Health Related Guideline Level  
2. Aesthetic Guideline Level  
3. Maximum Admissable Concentration (MADC)
- G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- I NEW YORK STATE AMBIENT WATER GUIDELINE
- N/A NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

. No Sample Taken

BDL Below Minimum Measurement Amount

<T Greater Than Detection Limit But Not Confident  
(SEE INTERPRETATION OF RESULTS ABOVE)

> Results Are Greater Than The Upper Limit

<=> Approximate Result

!48 No Data: Sample Age Exceeded 48 Hours

!AR No Data: No Numeric Results

!AW No Data: Analysis Withdrawn

!BT No Data: Sample Broken In Transit

!CS No Data: Contamination Suspected

!EF No Data: Laboratory Equipment Failure

!IR No Data: Insufficient Sample

!IS No Data: Insufficient Sample

!LA No Data: Laboratory Accident

!NP No Data: No Procedure

!NR No Data: Sample Not Received

!OP No Data: Obscured Plate

!PE No Data: Procedure Error: Sample Discarded

!PR No Data: Preservative Required

!QU No Data: Quality Control Unacceptable

!RE No Data: Received Empty

!RO No Data: No Numeric Results

!SM No Data: Sample Missing

!SS No Data: Sample Improperly Preserved

!U No Data: Sample Unsuitable For Analysis

!UB No Data: Bottle Broken

!UN No Data: Result Unreliable

!UR	No Data: Unpreserved Sample Required
A	Approximate Value
A3C	Approximate, Total Count Exceeded 300 Colonies
A>	Approximate Value, Exceeded Normal Range
APS	Additional Peak, Less Than, Not Priority Pollutant
ARO	Additional Information In Laboratory Report
CRO	Calculated Result Only
NAF	Not All Required Tests Found
RID	Ioncal Calculated on Incomplete Data Set
RMP	P and M-Xylene Not Separated
RRR	Result Obtained by Repeat Analysis
RRV	Rerun Verification
SFA	Sample Filtered: Filtrate Analyzed
SIL	Sample Incorrectly Labelled
SPS	Several Peaks, Small, Not Priority Pollutant
U48	Unreliable: Sample Age Exceeded 48 Hours
UAL	Unreliable: Sample Age Exceeded Limit
UAU	Unreliable: Sample Age Unknown
UCS	Unreliable: Contamination Suspected
WSD	Wrong Sample Description On Bottle

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
BACTERIOLOGICAL					
FECAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0		GUIDELINE = 0 (A1)	
1991 FEB	88				
1991 APR	12				
1991 JUN	76				
1991 AUG	8				
1991 OCT	12				
1991 NOV	20				
1992 MAY	280				
1992 JUN	40 <=>				
1992 AUG	90 <=>				
1992 OCT	130				
1992 DEC	100				
STANDARD PLATE CNT MF (CT/ML)					
		DET'N LIMIT = 0		GUIDELINE = 500 (A3)	
1991 FEB		4 <=>	3 <=>		3 <=>
1991 APR		7 <=>	2 <=>		8 <=>
1991 JUN		65	2400 >		2200
1991 AUG		5 <=>	1200		
1991 OCT		0 <=>	7 <=>		1 <=>
1991 NOV		1 <=>	4 <=>		
1992 FEB			1 <=>		
1992 MAY		29	2 <=>		
1992 JUN		2 <=>	2400 >		
1992 AUG		430 A3C	2400 >		
1992 OCT		24	26		
1992 DEC		5 <=>	2 <=>		
TOTAL COLIFORM MF (CT/100ML)					
		DET'N LIMIT = 0		GUIDELINE = 5/100ML (A1)	
1991 FEB	15000				
1991 APR	3600				
1991 JUN	500 A3C				
1991 AUG	140 <=>				
1991 OCT	600 <=>				
1991 NOV	180 <=>				
1992 MAY	17000				
1992 JUN	600 <=>				
1992 AUG	3100 A3C				
1992 OCT	1100 A3C				
1992 DEC	8800				

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
BACTERIOLOGICAL					
T COLIFORM	BCKGRD MF (CT/100ML)	DET'N LIMIT = 0		GUIDELINE = N/A	
1991 FEB	50000	.	.	.	.
1991 APR	11000	.	.	.	.
1991 JUN	20000 A3C	.	.	.	.
1991 AUG	48000 >	.	.	.	.
1991 OCT	12900	.	.	.	.
1991 NOV	6200 A3C	.	.	.	.
1992 MAY	70000	.	.	.	.
1992 JUN	44000 A3C	.	.	.	.
1992 AUG	8200 A3C	.	.	.	.
1992 OCT	45000 A3C	.	.	.	.
1992 DEC	12000	.	.	.	.

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
CHEMISTRY (FIELD)					
FLO CHLORINE (COMB) (MG/L)		DET'N LIMIT = 0	GUIDELINE = N/A		
1991 FEB	.400	.190	.080	.000	.100
1991 APR	.200	.100	.050	.200	.100
1991 JUN	.400	.200	.100	.000	.100
1991 OCT	.200	.230	.100	.100	.100
1991 NOV	.100	.200	.000	.100	.100
1992 FEB	1.000	.200	.000	.100	.100
1992 MAY	.300	.150	.000	.100	.100
1992 JUN	.300	.200	.000	.100	.100
1992 AUG	.300	.100	.000	.100	.100
1992 OCT	.200	.200	.050	.100	.100
1992 DEC					
FLO CHLORINE FREE (MG/L)		DET'N LIMIT = 0	GUIDELINE = N/A		
1991 FEB	.600	.100	.000	.100	.000
1991 APR	1.000	.100	.050	.100	.100
1991 JUN	.600	.000	.000	.100	.100
1991 AUG	.300	.300	.000	.100	.000
1991 OCT	1.100	.100	.000	.100	.000
1991 NOV	1.000	.100	.100	.100	.100
1992 FEB	.500	.100	.100	.100	.100
1992 MAY	.100	.300	.000	.100	.100
1992 JUN	1.100	.100	.100	.100	.100
1992 AUG	.900	.100	.100	.100	.100
1992 OCT	1.000	.100	.050	.100	.100
1992 DEC					
FLO CHLORINE (TOTAL) (MG/L)		DET'N LIMIT = 0	GUIDELINE = N/A		
1991 FEB	1.000	.290	.080	.100	.100
1991 APR	1.200	.350	.100	.300	.300
1991 JUN	1.000	.100	.050	.100	.200
1991 AUG	.500	.500	.100	.200	.100
1991 OCT	1.300	.330	.100	.100	.100
1991 NOV	1.100	.300	.100	.100	.100
1992 FEB	1.000	.300	.100	.100	.100
1992 MAY	.100	.300	.100	.100	.100
1992 JUN	1.400	.250	.100	.100	.100
1992 AUG	.200	.300	.100	.100	.100
1992 OCT	1.200	.300	.100	.100	.100
1992 DEC	1.200	.300	.100	.100	.100

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST		DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST		DIST. SYSTEM RICHMOND ST STANDING
		FREE FLOW	FREE FLOW		FREE FLOW	STANDING	
CHEMISTRY (FIELD)							
FLD PH (DMNSLESS)		DET'N LIMIT = N/A			GUIDELINE = 6.5-8.5 (A4)		
1991 FEB	7.700	7.100	7.100	7.300	7.100	7.300	7.300
1991 APR	8.200	7.500	7.400	7.500	7.500	7.400	7.400
1991 JUN	8.100	7.500	7.500	7.600	7.600	7.600	7.600
1991 AUG		7.400	7.400	7.400	7.400		
1991 OCT	7.900	7.400	7.500	7.400	7.500	7.500	7.500
1991 NOV	7.700	7.500	7.600	7.700			
1992 FEB		7.300	7.300	7.300			
1992 MAY	7.800	6.800	6.800	6.800			
1992 JUN	8.100	7.500	7.500	7.500			
1992 AUG		7.500	7.500	7.500			
1992 OCT	8.000	7.800	7.700	7.700			
1992 DEC	8.400	8.000	7.700	7.800			
FLD TEMPERATURE (DEG.C)							
		DET'N LIMIT = N/A			GUIDELINE = 15 (A3)		
1991 FEB	1.500	2.000	4.000	19.000	4.000	10.000	10.000
1991 APR	11.000	12.000	10.000	21.000	10.000	.800	.800
1991 JUN	21.000	22.500	21.000	21.500	16.000	18.000	18.000
1991 AUG			22.000	22.000			
1991 OCT	11.000	12.000	15.000	20.500	12.000	15.000	15.000
1991 NOV	6.500	7.000	9.500	19.000			
1992 FEB	3.000	6.000	4.000	21.500			
1992 MAY	14.000	15.000	11.000	19.000			
1992 JUN	21.500	21.500	18.000	20.000			
1992 AUG			20.500	21.000			
1992 OCT	11.500	13.000	15.000	21.000			
1992 DEC	4.500	4.000	8.000	22.000			
FLD TURBIDITY (FTU)							
		DET'N LIMIT = N/A			GUIDELINE = 1.0 (A1)		
1991 FEB	33.000	.330	.460	.480	.580	.880	.880
1991 APR	38.000	.220	.270	.390	1.580	1.110	1.110
1991 JUN	.740	.290	.320	.500	.960	1.140	1.140
1991 AUG			.590	2.600			
1991 OCT	29.000	.160	.220	.340	.360	.290	.290
1991 NOV	15.200	.080	.160	.520			
1992 FEB	99.000	.230	.100	.510			
1992 MAY	63.000		.160	.210			
1992 JUN	53.000	.270	.230	.690			
1992 OCT	20.000	.300					
1992 DEC	9.000	.160	.380	.260			



TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
CHEMISTRY (LABORATORY)					
ALKALINITY (MG/L)		DET'N LIMIT = 0.2		GUIDELINE = 30-500 (A4)	
1991 FEB	200.700	177.400	183.100	179.000	181.100
1991 APR	238.500	236.100	213.900	209.100	216.400
1991 JUN	239.100	236.900	224.200	232.100	229.500
1991 AUG	167.000	156.000	146.700	155.400	-
1991 OCT	194.500	180.700	182.300	182.400	182.900
1991 NOV	210.300	205.500	208.000	207.400	-
1992 FEB	148.600	194.000	175.800	149.300	-
1992 MAY	161.200	148.500	72.000	100.000	-
1992 JUN	204.300	198.800	186.500	196.000	-
1992 AUG	236.300	209.200	229.700	213.300	-
1992 OCT	256.100	260.600	258.100	259.400	-
1992 DEC	271.600	270.100	267.800	264.000	-
CALCIUM (MG/L)		DET'N LIMIT = 0.20		GUIDELINE = 100 (F2)	
1991 FEB	89.400	87.300	88.300	88.300	89.900
1991 APR	102.100	101.400	100.800	99.100	97.700
1991 JUN	96.400	102.000	102.000	103.000	101.000
1991 AUG	58.400	59.000	60.000	61.200	-
1991 OCT	72.900	72.500	72.600	73.300	71.000
1991 NOV	90.900	88.900	89.100	91.000	-
1992 FEB	77.600	97.300	99.300	86.800	-
1992 MAY	77.800	83.650	83.800	92.800	-
1992 JUN	97.700	94.800	91.900	93.700	-
1992 AUG	101.200	93.900	99.900	97.100	-
1992 OCT	100.400	103.300	106.700	107.900	-
1992 DEC	84.700	98.200	102.000	108.000	-
CYANIDE (MG/L)		DET'N LIMIT = 0.001		GUIDELINE = 0.2 (A1)	
16 SAMPLES	BDL	BDL	-	-	-

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	CHEMISTRY (LABORATORY)				DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST. FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
		CHLORIDE (MG/L)	COLOUR (H2U)	DET'N LIMIT = 0.20	GUIDELINE = 250 (A3)				
1991 FEB	22,800	24,700	25,100	25,000	25,600	25,200			
1991 APR	27,300	28,300	28,000	28,100	29,100	28,800			
1991 JUN	28,400	31,100	32,300	31,900	32,000	33,200			
1991 AUG	28,500	31,200	30,800	31,600					
1991 OCT	28,700	30,500	29,800	31,000	30,100	30,100			
1991 NOV	30,000	31,200	31,800	32,300					
1992 FEB	34,100	44,500	39,800	36,400					
1992 MAY	24,500	24,100	21,800	22,700					
1992 JUN	30,700	32,300	32,700	32,700					
1992 AUG	28,600	28,900	31,500	30,900					
1992 OCT	28,100	30,500	31,200	29,800					
1992 DEC	24,900	27,000	26,800	26,700					
COLOUR (H2U)									
1991 FEB	16,000	14,000	5,500	6,500	7,500	8,000			
1991 APR	7,500	4,000	4,000	4,500	8,000	7,000			
1991 JUN	15,000	10,000	10,000	10,500	11,500	11,000			
1991 AUG	10,500	5,000	3,500	4,000		4,000			
1991 OCT	9,500	4,000	4,000	4,500	5,500	4,000			
1991 NOV	7,000	4,000	4,500	5,000					
1992 FEB	BOL	5,000	6,500	8,000					
1992 MAY	23,000	7,000	2,500	4,000					
1992 JUN	22,000	7,500	8,000	9,000					
1992 AUG	19,500	11,000	9,000	9,500					
1992 OCT	11,500	6,000	8,000	8,000					
1992 DEC	13,000	7,500	7,000	8,500					
CONDUCTIVITY (UMHO/CM)									
1991 FEB	547	563	570	563	574	571			
1991 APR	623	636	631	625	629	631			
1991 JUN	654	678	678	673	669	676			
1991 AUG	480	504	493	502					
1991 OCT	543	565	567	568	567	569			
1991 NOV	618	635	641	643					
1992 FEB	606	743	709	643					
1992 MAY	500	565	573	614					
1992 JUN	626	656	639	653					
1992 AUG	648	650	678	659					
1992 OCT	668	667	662	666					
1992 DEC	690	704	703	696					

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
CHEMISTRY (LABORATORY)					
DISS ORG CARBON (MG/L)		DET*N LIMIT = 0.10		GUIDELINE = 5.0 (A3)	
1991 FEB	5.200	3.600	3.700	3.700	3.800
1991 APR	4.400	3.200	3.700	3.400	3.700
1991 JUN	5.300	5.000	5.000	3.200	3.100
1991 AUG	4.200	3.600	3.300	4.900	4.900
1991 OCT	3.500	2.900	3.100	*	*
1991 NOV	3.700	3.200	2.900	2.600	2.800
1992 FEB	4.400	3.800	3.600	*	*
1992 MAY	6.300	3.800	3.500	*	*
1992 JUN	5.000	4.300	2.200	*	*
1992 AUG	5.700	4.900	4.200	*	*
1992 OCT	3.900	3.800	4.800	*	*
1992 DEC	4.200	4.000	3.700	*	*
FLUORIDE (MG/L)		DET*N LIMIT = 0.01		GUIDELINE = 1.5 (A1)	
1991 FEB	.120	.100	.100	.100	.100
1991 APR	.120	.120	.120	.120	.120
1991 JUN	.160	.160	.140	.160	.160
1991 AUG	.140	.120	.120	.080	*
1991 OCT	.120	.100	.100	.100	.100
1991 NOV	.120	.120	.120	*	*
1992 FEB	.140	.120	.120	.120	*
1992 MAY	.200	.160	.100	.100	*
1992 JUN	.160	.160	.160	*	*
1992 AUG	.160	.140	.160	.140	*
1992 OCT	.120	.120	.120	.120	*
1992 DEC	.040 <t	.080	.100	.100	*
HARDNESS (MG/L)		DET*N LIMIT = 0.5		GUIDELINE = 80-100 (A4)	
1991 FEB	285.500	279.500	282.700	282.100	286.800
1991 APR	331.400	330.200	323.200	320.700	316.100
1991 JUN	312.000	325.000	326.000	328.000	320.800
1991 AUG	218.400	219.000	222.000	225.000	322.000
1991 OCT	257.000	255.900	256.700	225.000	*
1991 NOV	305.000	298.000	299.500	303.900	257.600
1992 FEB	257.000	331.400	318.000	278.000	*
1992 MAY	247.000	263.000	260.000	303.900	*
1992 JUN	130.000	311.000	303.000	288.000	*
1992 AUG	325.000	301.000	318.800	307.000	*
1992 OCT	328.000	334.000	342.000	309.800	*
1992 DEC	287.000	321.000	330.000	345.000	*
				352.000	*

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
CHEMISTRY (LABORATORY)					
IONCAL (DMNSLESS )		DET'N LIMIT = N/A	GUIDELINE = N/A		
1991 FEB	1.033	1.075	1.390	.253	2.157
1991 APR	.704 NAF	.277 NAF	.146 NAF	3.272 NAF	2.268 NAF
1991 JUN	4.814 NAF	.808 NAF	.393 NAF	.851 NAF	2.343 NAF
1991 AUG	1.991	3.051	1.441	.	.433
1991 OCT	1.679	1.138	3.225	2.294	.
1991 NOV	1.325 NAF	2.716 NAF	2.468 NAF	.	.
1992 FEB	3.915	.439	2.121	.	.
1992 MAY	.402 NAF	1.725 NAF	1.714 NAF	.	.
1992 JUN	1.238	1.199	1.350	.	.
1992 AUG	.223	.254	1.379	.	.
1992 OCT	3.660	1.519	.552	.	.
1992 DEC	24.170	7.883	2.785	.	.
POTASSIUM (MG/L )		DET'N LIMIT = 0.01	GUIDELINE = 10 (F2)		
1991 FEB	2.960	2.480	2.700	2.580	2.710
1991 APR	2.660	2.510	2.700	2.510	2.650
1991 JUN	3.800	3.600	3.650	3.550	3.700
1991 AUG	2.940	2.870	2.950	.	.
1991 OCT	3.880	3.830	3.820	3.780	3.790
1991 NOV	3.430	3.370	3.440	.	.
1992 FEB	4.390	2.840	3.030	.	.
1992 MAY	4.880	2.679	2.703	2.728	.
1992 JUN	3.440	3.160	3.190	.	.
1992 AUG	4.003	3.911	3.937	.	.
1992 OCT	3.730	3.710	3.760	.	.
1992 DEC	3.149	3.135	3.231	.	.
LANGELIERS INDEX (DMNSLESS )		DET'N LIMIT = N/A	GUIDELINE = N/A		
1991 FEB	1.038	.613	.852	.662	.714
1991 APR	1.324 NAF	1.077 NAF	.964 NAF	1.062 NAF	1.038 NAF
1991 JUN	1.209	1.078	1.064	1.040	1.041
1991 AUG	.800	.743	.847	.	.
1991 OCT	.887	.900	.579	.536	.611
1991 NOV	1.239	1.159	1.102	.	.
1992 FEB	.921	1.218	.899	.	.
1992 MAY	.957	.857	.406	.	.
1992 JUN	1.358	1.211	1.190	.	.
1992 AUG	1.325	1.049	1.032	.	.
1992 OCT	1.276	1.295	1.292	.	.
1992 DEC	1.186	1.177	1.139	.	.

TABLE 4

## DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
CHEMISTRY (LABORATORY)					
MAGNESIUM (MG/L)		DET'N LIMIT = 0.1		GUIDELINE = 30.0 (F2)	
1991 FEB	15.150	15.100	15.000	15.150	15.150
1991 APR	18.600	17.350	17.800	17.450	18.100
1991 JUN	17.400	17.200	17.200	17.100	17.000
1991 AUG	17.650	17.400	17.600		
1991 OCT	18.200	18.300	18.250		
1991 NOV	18.950	18.750	18.600	18.350	18.450
1992 FEB	15.300	21.400	14.800		
1992 MAY	12.840	13.360	13.740		
1992 JUN	18.200	18.900	17.800		
1992 AUG	17.500	16.080	16.380		
1992 OCT	18.700	18.500	18.500		
1992 DEC	18.400	18.400	17.900		
SODIUM (MG/L)					
		DET'N LIMIT = 0.20		GUIDELINE = 200 (A4)	
1991 FEB	8.400	12.900	12.600	12.600	12.600
1991 APR	10.600	12.400	12.200	11.800	11.800
1991 JUN	11.000	14.400	14.200	14.000	14.000
1991 AUG	13.900	17.500	15.400		
1991 OCT	14.600	19.300	19.300		
1991 NOV	13.800	17.300	17.100	19.300	19.700
1992 FEB	13.200	20.700	18.000		
1992 MAY	8.850	11.360	11.830		
1992 JUN	11.300	16.600	17.200		
1992 AUG	11.280	19.460	15.220		
1992 OCT	12.300	13.800	13.700		
1992 DEC	10.110	13.040	12.900		
AMMONIUM TOTAL (MG/L)					
		DET'N LIMIT = 0.002		GUIDELINE = 0.05 (F2)	
1991 FEB	.110	.002 <T	.004 <T	.012	.020
1991 APR	.010	.004 <T	.006 <T	.012	.008 <T
1991 JUN	.002 <T	.012	.004 <T	BOL	.004 <T
1991 AUG	.080	.006 <T	.008 <T		
1991 OCT	.048	.002 <T	.024	BOL	.008 <T
1991 NOV	.006 <T	.004 <T	.004 <T		
1992 FEB	.168	.018	.060		
1992 MAY	.044	.030	.038		
1992 JUN	BOL	.006 <T	.016		
1992 AUG	.032	.006 <T	.004 <T		
1992 OCT	.020	BOL	.010		
1992 DEC	.020	BOL	.018		

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
CHEMISTRY (LABORATORY)					
NITRITE (MG/L)		DET'N LIMIT = 0.001		GUIDELINE = 1.0 (A1)	
1991 FEB	.030	BOL	.001 <T	.001 <T	BOL
1991 APR	.028	BOL	.002 <T	.001 <T	.003 <T
1991 JUN	.065	.002 <T	.001 <T	.003 <T	.002 <T
1991 AUG	.012	.001 <T	.001 <T	.013	.013
1991 OCT	.040	.002 <T	.002 <T	.002 <T	.002 <T
1991 NOV	.008	BOL	.001 <T	.001 <T	.002 <T
1992 FEB	.087	.003 <T	.003 <T	.007	.
1992 MAY	.129	.002 <T	.001 <T	.003 <T	.
1992 JUN	.066	.003 <T	.004 <T	.004 <T	.
1992 AUG	.020	.003 <T	.004 <T	.005	.
1992 OCT	.016	.002 <T	.004 <T	.004 <T	.
1992 DEC	.069	.001 <T	.003 <T	.003 <T	.
NITRATE (TOTAL) (MG/L)		DET'N LIMIT = 0.005		GUIDELINE = 10.0 (A1)	
1991 FEB	5.890	5.680	5.770	5.660	5.820
1991 APR	5.210	5.240	5.230	5.280	5.620
1991 JUN	6.600	6.670	7.770	6.700	5.240
1991 AUG	.100	.130	.095	.115	6.830
1991 OCT	.315	.260	.290	.260	.285
1991 NOV	1.770	1.790	1.800	1.860	.
1992 FEB	10.400	9.880	9.980	10.200	.
1992 MAY	7.400	7.340	6.820	6.880	.
1992 JUN	7.970	7.950	8.400	7.880	.
1992 AUG	6.120	7.960	5.840	7.420	.
1992 OCT	4.550	4.580	4.720	4.660	.
1992 DEC	6.090	6.080	5.950	5.960	.
NITROGEN TOT KJELD (MG/L)		DET'N LIMIT = 0.02		GUIDELINE = N/A	
1991 FEB	.950	.430	.410	.440	.480
1991 APR	.580	.370	.390	.430	.460
1991 JUN	.830	.600	.640	.640	.720
1991 AUG	.530	.320	.360	.340	.
1991 OCT	.580	.290	.280	.310	.290
1991 NOV	.490	.360	.350	.410	.
1992 FEB	.940	.470	.470	.540	.
1992 MAY	.860	.590	.380	.430	.
1992 JUN	.640	.450	.440	.490	.
1992 AUG	.890	.620	.610	.630	.
1992 OCT	.650	.470	.490	.540	.
1992 DEC	.650	.540	.490	.570	.

TABLE 4

## DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	CHEMISTRY (LABORATORY)				DIST. SYSTEM MOONEY ST FREE FLOW		DIST. SYSTEM MOONEY ST STANDING		DIST. SYSTEM RICHMOND ST FREE FLOW		DIST. SYSTEM RICHMOND ST STANDING	
			PH (DMNSLESS)				DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5 (A4)					
1991 FEB	8.250	7.890	7.890	8.130	8.120	7.930	7.970							
1991 APR	8.410	8.190	8.190	8.100	8.120	8.210	8.180							
1991 JUN	8.320	8.170	8.170	8.150	8.160	8.150	8.160							
1991 AUG	8.270	8.240	8.240	8.020	8.130	7.920	7.950							
1991 OCT	8.200	8.250	8.250	7.890	7.920	7.890								
1991 NOV	8.430	8.370	8.370	8.330	8.300									
1992 FEB	8.330	8.420	8.420	8.250	8.260									
1992 MAY	8.320	8.230	8.230	7.670	7.910									
1992 JUN	8.530	8.410	8.410	8.430	8.400									
1992 AUG	8.420	8.230	8.230	8.200	8.190									
1992 OCT	8.340	8.340	8.340	8.270	8.320									
1992 DEC	8.300	8.230	8.230	8.170	8.160									
PHOSPHORUS FIL REACT (MG/L)			DET'N LIMIT = 0.0005				GUIDELINE = N/A							
1991 FEB	.054	.001 <T												
1991 APR	.021	.000 <T												
1991 JUN	.057	.017												
1991 AUG	.005	.001 <T												
1991 OCT	.016	.001 <T												
1991 NOV	.003	.000 <T												
1992 FEB	.058	.006												
1992 MAY	.047	.001 <T												
1992 JUN	.021	.001 <T												
1992 AUG	.031	BOL												
1992 OCT	.002 <T	.001 <T												
1992 DEC	.015	.009												
PHOSPHORUS TOTAL (MG/L)			DET'N LIMIT = 0.002				GUIDELINE = 0.40 (F2)							
1991 FEB	.100	.006 <T												
1991 APR	.057	.004 <T												
1991 JUN	.102	.023												
1991 AUG	.049	.008 <T												
1991 OCT	.048	BOL												
1991 NOV	.025	.006 <T												
1992 FEB	.188	.009 <T												
1992 MAY	1.020	.008 <T												
1992 JUN	.087	.003 <T												
1992 AUG	.097	.011												
1992 OCT	.042	.009 <T												
1992 DEC	.038	.016												



TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
CHEMISTRY (LABORATORY)					
RESIDUE FILTRATE (MG/L)		DET'N LIMIT = N/A		GUIDELINE = 500 (A3)	
1991 FEB:	356,000 CRO	366,000 CRO	371,000 CRO	366,000 CRO	371,000 CRO
1991 APR	405,000 CRO	413,000 CRO	410,000 CRO	406,000 CRO	410,000 CRO
1991 JUN	425,000 CRO	437,000 CRO	441,000 CRO	437,000 CRO	439,000 CRO
1991 AUG	312,000 CRO	328,000 CRO	320,000 CRO	326,000 CRO	
1991 OCT	353,000 CRO	367,000 CRO	369,000 CRO	369,000 CRO	
1991 NOV	402,000 CRO	413,000 CRO	417,000 CRO	418,000 CRO	370,000 CRO
1992 FEB	394,000 CRO	483,000 CRO	461,000 CRO	418,000 CRO	
1992 MAY	325,000 CRO	367,000 CRO	372,000 CRO	399,000 CRO	
1992 JUN	407,000 CRO	426,000 CRO	415,000 CRO	424,000 CRO	
1992 AUG	421,000 CRO	422,000 CRO	441,000 CRO	428,000 CRO	
1992 OCT	421,000 CRO	434,000 CRO	430,000 CRO	433,000 CRO	
1992 DEC	448,000 CRO	458,000 CRO	457,000 CRO	452,000 CRO	
SULPHATE (MG/L)		DET'N LIMIT = 0.20		GUIDELINE = 500 (A3)	
1991 FEB	48,890	70,260	70,870	71,310	71,040
1991 APR	62,210	75,870	78,940	80,260	77,480
1991 JUN	52,550	57,350	63,380	58,620	63,240
1991 AUG	48,160	65,400	66,140	65,880	
1991 OCT	60,110	78,310	75,790	77,030	76,940
1991 NOV	81,460	83,940	89,030	90,710	
1992 FEB	66,380	95,860	93,260	86,940	
1992 MAY	49,520	90,250	163,330	159,780	
1992 JUN	64,680	79,430	77,640	79,790	
1992 AUG	52,900	62,840	69,000	66,620	
1992 OCT	57,940	62,890	61,420	61,600	
1992 DEC	58,090	61,070	61,920	60,560	
TURBIDITY (FTU)		DET'N LIMIT = 0.05		GUIDELINE = 1.0 (A1)	
1991 FEB	33,000 RRV	1,080 RRV	.710	1,060 RRV	1,090 RRV
1991 APR	33,000	.230 <1	.330	.500	.930
1991 JUN	65,000	.310	.460	.470	.840
1991 AUG	11,000	.470	4,500 RRV	.520	
1991 OCT	13,300	.410	.390	.680	.640
1991 NOV	12,400	.330	.510	.780	
1992 FEB	96,000	.180 <1	.100 <1	.590	
1992 MAY	200,000 >	.680	.370	.420	
1992 JUN	81,000	.520	.370	.890	
1992 AUG	50,000	.560	.590	.700	
1992 OCT	10,900	.430	.420	.840	
1992 DEC	.830	.400	.650	.610	



TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

SILVER (UG/L)	METALS	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
56 SAMPLES	DET'N LIMIT = 0.05	BDL	BDL	BDL	BDL	BDL	BDL
ALUMINUM (UG/L)	DET'N LIMIT = 0.10	BDL	BDL	BDL	BDL	BDL	BDL
	GUIDELINE = N/A						
1991 FEB	280.000	67.000	16.000	84.000	15.000	18.000	
1991 APR	290.000	64.000	30.000	72.000	12.000	28.000	
1991 JUN	480.000	120.000	86.000	62.000	37.000	44.000	
1991 AUG	130.000	65.000	960.000	55.000	31.000	26.000	
1991 OCT	220.000	26.000	25.000	75.000	170.000		
1991 NOV	190.000	82.000	66.000	170.000			
1992 FEB	730.000	36.000	27.000	160.000			
1992 MAY	3381.000	41.000	12.000	12.000			
1992 JUN	890.000	110.000	92.000	130.000			
1992 AUG	320.000	120.000	120.000	120.000			
1992 OCT	150.000	170.000	140.000	170.000			
1992 DEC	86.000	53.000	47.000	74.000			
ARSENIC (UG/L)	DET'N LIMIT = 0.10	BDL	BDL	BDL	BDL	BDL	BDL
	GUIDELINE = 25 (A1)						
1991 FEB	.660 <T	.160 <T	.310 <T	.240 <T	BDL	.160 <T	
1991 APR	.540 <T	.350 <T	.350 <T	.390 <T	.340 <T	.200 <T	
1991 JUN	.250 <T	.290 <T	.200 <T	.140 <T	BDL	BDL	
1991 AUG	2.000	1.100	1.300	.970 <T			
1991 OCT	1.100	.680 <T	.760 <T	.700 <T	.700 <T	.570 <T	
1991 NOV	.780 <T	.750 <T	.860 <T	1.100			
1992 FEB	1.100	.660 <T	.550 <T	.540 <T			
1992 MAY	.620 <T	.260 <T	.220 <T	.260 <T			
1992 JUN	1.400	.870 <T	.670 <T	.920 <T			
1992 AUG	1.800	.940 <T	1.200	1.000 <T			
1992 OCT	1.100	1.200	.960 <T	.960 <T			
1992 DEC	.400 <T	.390 <T	.550 <T	.390 <T			

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

METALS					
TREATMENT PLANT RAW	TREATMENT PLANT TREATED	TREATMENT PLANT	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST STANDING
BARIUM (UG/L)					
			DET'N LIMIT = 0.05		GUIDELINE = 1000 (A2)
1991 FEB	32.000	21.000	21.000	25.000	22.000
1991 APR	38.000	30.000	29.000	30.000	27.000
1991 JUN	50.000	42.000	42.000	40.000	39.000
1991 AUG	41.000	38.000	40.000	37.000	
1991 OCT	44.000	40.000	38.000	40.000	37.000
1991 NOV	48.000	36.000	35.000	43.000	
1992 FEB	45.000	33.000	31.000	36.000	
1992 MAY	90.000	32.000	53.000	51.000	
1992 JUN	65.000	39.000	41.000	41.000	
1992 AUG	48.000	37.000	36.000	38.000	
1992 OCT	45.000	43.000	42.000	44.000	
1992 DEC	40.000	30.000	29.000	33.000	
BORON (UG/L)					
			DET'N LIMIT = 2.00		GUIDELINE = 5000 (A1)
1991 FEB	21.000	27.000	29.000	27.000	28.000
1991 APR	39.000	28.000	40.000	39.000	40.000
1991 JUN	36.000	38.000	37.000	40.000	40.000
1991 AUG	42.000	46.000	44.000	45.000	
1991 OCT	37.000	56.000	57.000	36.000	
1991 NOV	54.000	52.000	52.000	59.000	48.000
1992 FEB	27.000	28.000	29.000	29.000	
1992 MAY	31.000	29.000	30.000	31.000	
1992 JUN	44.000	36.000	40.000	39.000	
1992 AUG	120.000	99.000	58.000	100.000	
1992 OCT	41.000	59.000	47.000	45.000	
1992 DEC	30.000	27.000	30.000	28.000	
BERYLLIUM (UG/L)					
			DET'N LIMIT = 0.05		GUIDELINE = 6800 (D4)
1991 FEB	.070 <T	BDL	BDL	BDL	BDL
1991 APR	BDL	BDL	BDL	BDL	BDL
1991 JUN	.070 <T	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL
1991 NOV	.060 <T	BDL	BDL	BDL	
1992 FEB	.140 <T	BDL	BDL	BDL	
1992 MAY	.440 <T	BDL	.090 <T	BDL	
1992 JUN	.160 <T	BDL	BDL	BDL	
1992 AUG	.140 <T	BDL	BDL	BDL	
1992 OCT	BDL	BDL	BDL	BDL	
1992 DEC	BDL	BDL	.060 <T	BDL	

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
METALS					
CADMIUM (UG/L)					
		DET'N LIMIT = 0.05		GUIDELINE = 5.0 (A1)	
1991 FEB	BDL	BDL	BDL	BDL	.070 <T
1991 APR	BDL	BDL	BDL	BDL	.060 <T
1991 JUN	BDL	.060 <T	.080 <T	BDL	.120 <T
1991 AUG	BDL	.070 <T	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	.060 <T	BDL	BDL	BDL
1992 MAY	.220 <T	.070 <T	.100 <T	BDL	BDL
1992 JUN	.150 <T	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	.090 <T	BDL	BDL	BDL
1992 DEC	BDL	BDL	.060 <T	BDL	BDL
COBALT (UG/L)					
		DET'N LIMIT = 0.02		GUIDELINE = N/A	
1991 FEB	.360 <T	.100 <T	.090 <T	.110 <T	.150 <T
1991 APR	.470 <T	.180 <T	.180 <T	.190 <T	.250 <T
1991 JUN	BDL	BDL	BDL	BDL	BDL
1991 AUG	.330 <T	.190 <T	.860 <T	.220 <T	BDL
1991 OCT	.400 <T	.150 <T	.070 <T	.100 <T	.120 <T
1991 NOV	.320 <T	.180 <T	.190 <T	.130 <T	BDL
1992 FEB	1.300	.610 <T	.370 <T	.370 <T	BDL
1992 MAY	2.500	.270 <T	.340 <T	.320 <T	BDL
1992 JUN	.800 <T	.130 <T	.220 <T	.220 <T	BDL
1992 AUG	.430 <T	.150 <T	.200 <T	.140 <T	BDL
1992 OCT	.360 <T	.250 <T	.280 <T	.280 <T	BDL
1992 DEC	.200 <T	.170 <T	.270 <T	.180 <T	BDL
CHROMIUM (UG/L)					
		DET'N LIMIT = 0.50		GUIDELINE = 50.0 (A1)	
1991 FEB	1.000 <T	3.200 <T	3.600 <T	2.500 <T	3.200 <T
1991 APR	3.700 <T	.530 <T	3.000 <T	2.900 <T	3.000 <T
1991 JUN	BDL	BDL	BDL	.810 <T	BDL
1991 AUG	2.800 <T	2.700 <T	2.400 <T	2.500 <T	BDL
1991 OCT	.690 <T	5.800	5.800	BDL	BDL
1991 NOV	5.200	3.800 <T	4.700 <T	4.700 <T	6.200
1992 FEB	1.300 <T	.810 <T	BDL	BDL	BDL
1992 MAY	3.300 <T	BDL	BDL	BDL	BDL
1992 JUN	1.300 <T	BDL	BDL	BDL	BDL
1992 AUG	6.300	5.200	1.600 <T	5.100	BDL
1992 OCT	2.300 <T	11.000	4.800 <T	2.400 <T	BDL
1992 DEC	2.100 <T	.950 <T	1.700 <T	.600 <T	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
METALS					
COPPER (UG/L)		DET'N LIMIT = 0.50		GUIDELINE = 1000 (A3)	
1991 FEB	9,700	1,500 <T	3,300 <T	65,000	410,000
1991 APR	13,000	1,700 <T	4,700 <T	79,000	310,000
1991 JUN	13,000	3,000 <T	5,500	34,000	320,000
1991 AUG	16,000	2,500 <T	6,800	54,000	670,000
1991 OCT	12,000	2,400 <T	7,400	75,000	
1991 NOV	13,000	1,800 <T	6,200	76,000	
1992 FEB	7,900	2,100 <T	7,000	100,000	
1992 MAY	11,000	3,100 <T	27,000	450,000	
1992 JUN	14,000	2,100 <T	8,500	120,000	
1992 AUG	14,000	3,300 <T	14,000	140,000	
1992 OCT	3,100 <T	2,000 <T	9,900	110,000	
1992 DEC	4,000 <T	1,500 <T	11,000	110,000	
IRON (UG/L)		DET'N LIMIT = 6.00		GUIDELINE = 300 (A3)	
1991 FEB	380,000	BDL	BDL	BDL	100,000
1991 APR	400,000	6,300 <T	BDL	11,000 <T	120,000
1991 JUN	720,000	6,300 <T	BDL	BDL	88,000
1991 AUG	240,000	6,700 <T	40,000 <T	7,500 <T	49,000 <T
1991 OCT	400,000	7,300 <T	6,600 <T	12,000 <T	
1991 NOV	290,000	BDL	BDL	15,000 <T	
1992 FEB	880,000	17,000 <T	8,500 <T	31,000 <T	
1992 MAY	1300,000	16,000 <T	27,000 <T	13,000 <T	
1992 JUN	630,000	BDL	BDL	79,000	
1992 AUG	410,000	BDL	8,500 <T	6,500 <T	
1992 OCT	250,000	BDL	8,100 <T	17,000 <T	
1992 DEC	220,000	BDL	BDL	8,700 <T	
MERCURY (UG/L)		DET'N LIMIT = 0.02		GUIDELINE = 1.0 (A1)	
24 SAMPLES	BDL	BDL			

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
METALS					
MANGANESE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 50.0 (A3)	
1991 FEB	24,000	11,000	16,000	12,000	13,000
1991 APR	37,000	15,000	11,000	16,000	16,000
1991 JUN	57,000	5,600	8,200	5,300	12,000
1991 AUG	74,000	28,000	320,000	25,000	-
1991 OCT	57,000	22,000	7,900	17,000	13,000
1991 NOV	30,000	7,800	5,700	23,000	-
1992 FEB	79,000	6,500	7,500	22,000	-
1992 MAY	160,000	16,000	29,000	25,000	-
1992 JUN	66,000	5,100	4,700	11,000	-
1992 AUG	41,000	11,000	4,400	9,600	-
1992 OCT	33,000	6,700	5,800	10,000	-
1992 DEC	36,000	24,000	17,000	16,000	-
MOLYBDENUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = N/A	
1991 FEB	.400 <T	1,100	1,100	1,200	1,100
1991 APR	.640	1,500	1,500	1,500	1,600
1991 JUN	.990	2,400	2,500	2,700	2,500
1991 AUG	2,400	2,800	2,400	2,800	-
1991 OCT	.980	1,700	1,800	1,800	1,700
1991 NOV	1,200	1,400	1,500	1,400	-
1992 FEB	.430 <T	1,700	1,500	1,500	-
1992 MAY	.210 <T	2,100	1,100	1,100	-
1992 JUN	.900	2,600	2,800	2,700	-
1992 AUG	1,000	2,100	2,400	2,200	-
1992 OCT	.990	1,800	1,800	1,600	-
1992 DEC	.920	1,500	1,500	1,200	-
NICKEL (UG/L)		DET'N LIMIT = 0.20		GUIDELINE = 350 (03)	
1991 FEB	.590 <T	.550 <T	.630 <T	1,800 <T	14,000
1991 APR	1,600 <T	1,300 <T	2,900	4,000	4,100
1991 JUN	BDL	BDL	BDL	.460 <T	1,500 <T
1991 AUG	3,600	.710 <T	1,800 <T	1,900 <T	-
1991 OCT	1,700 <T	.390 <T	1,100 <T	2,000 <T	.790 <T
1991 NOV	.820 <T	BDL	.400 <T	1,600 <T	-
1992 FEB	3,800	3,300	2,700	3,500	-
1992 MAY	5,300	BDL	.960 <T	2,500	-
1992 JUN	2,800	1,600 <T	1,500 <T	2,100	-
1992 AUG	3,900	2,800	3,100	4,100	-
1992 OCT	BDL	BDL	BDL	.370 <T	-
1992 DEC	BDL	BDL	BDL	BDL	-

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
METALS					
LEAD (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 10 (A1)	
1991 FEB	.470 <T	BDL	.140 <T	3.300	.350 <T
1991 APR	.600	.120 <T	.160 <T	2.700	.320 <T
1991 JUN	1.000	.190 <T	.310 <T	.950	.120 <T
1991 AUG	.380 <T	.150 <T	.410 <T	1.800	12.000
1991 OCT	.480 <T	.080 <T	.360 <T	1.900	.430 <T
1991 NOV	.630	.090 <T	.270 <T	3.700	3.100
1992 FEB	1.900	.150 <T	.230 <T	9.300	.
1992 MAY	5.500	.480 <T	2.000	31.000	.
1992 JUN	1.700	.150 <T	.710	9.700	.
1992 AUG	.760	.590	.600	6.300	.
1992 OCT	.440 <T	1.100	.430 <T	5.700	.
1992 DEC	.190 <T	.060 <T	.370 <T	4.300	.
ANTIMONY (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 146 (D4)	
1991 FEB	.330 <T	.560	.590	.580	.620
1991 APR	.250 <T	.490 <T	.590	.530	.520
1991 JUN	.360 <T	.640	.640	.860	.610
1991 AUG	.540	.550	.540	.740	.850
1991 OCT	.410 <T	.630	.740	.580	.730
1991 NOV	.440 <T	.510	.600	.510	.
1992 FEB	.340 <T	.580	.650	.770	.
1992 MAY	.070 <T	.370 <T	.400 <T	.410 <T	.
1992 JUN	.190 <T	.310 <T	.430 <T	.360 <T	.
1992 AUG	.230 <T	.280 <T	.340 <T	.400 <T	.
1992 OCT	.400 <T	.480 <T	.570	.640	.
1992 DEC	.420 <T	.550	.800	.650	.
SELENIUM (UG/L)		DET'N LIMIT = 1.00		GUIDELINE = 10 (A1)	
1991 FEB	BDL	1.100 <T	1.400 <T	1.400 <T	1.100 <T
1991 APR	BDL	BDL	1.800 <T	1.100 <T	1.800 <T
1991 JUN	1.500 <T	1.500 <T	1.400 <T	1.700 <T	1.400 <T
1991 AUG	BDL	BDL	BDL	BDL	.
1991 OCT	BDL	BDL	BDL	1.600 <T	1.500 <T
1991 NOV	BDL	BDL	BDL	1.100 <T	1.500 <T
1992 FEB	BDL	BDL	2.000 <T	2.100 <T	.
1992 MAY	1.200 <T	BDL	BDL	1.100 <T	.
1992 JUN	BDL	BDL	BDL	1.100 <T	.
1992 AUG	1.200 <T	1.800 <T	1.100 <T	1.900 <T	.
1992 OCT	BDL	1.800 <T	2.300 <T	1.300 <T	.
1992 DEC	BDL	1.100 <T	1.700 <T	1.500 <T	.

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW		DIST. SYSTEM MOONEY ST STANDING		DIST. SYSTEM RICHMOND ST FREE FLOW		DIST. SYSTEM RICHMOND ST STANDING	
		DET'N LIMIT = 0.10		DET'N LIMIT = 0.10		GUIDELINE = N/A		GUIDELINE = N/A	
STRONTIUM (UG/L)									
1991 FEB	200.000	190.000	190.000	200.000	190.000	200.000	190.000	190.000	190.000
1991 APR	250.000	230.000	230.000	230.000	230.000	230.000	230.000	230.000	230.000
1991 JUN	230.000	230.000	230.000	230.000	230.000	230.000	230.000	230.000	240.000
1991 AUG	190.000	180.000	180.000	180.000	180.000	180.000	180.000	180.000	180.000
1991 OCT	180.000	180.000	180.000	180.000	180.000	180.000	180.000	180.000	180.000
1991 NOV	250.000	230.000	230.000	260.000	260.000	260.000	260.000	260.000	260.000
1992 FEB	230.000	250.000	230.000	220.000	220.000	220.000	220.000	220.000	220.000
1992 MAY	190.000	190.000	190.000	210.000	210.000	210.000	210.000	210.000	210.000
1992 JUN	250.000	240.000	240.000	240.000	240.000	240.000	240.000	240.000	240.000
1992 AUG	250.000	220.000	230.000	220.000	220.000	220.000	220.000	220.000	220.000
1992 OCT	270.000	270.000	270.000	270.000	270.000	270.000	270.000	270.000	270.000
1992 DEC	240.000	240.000	240.000	240.000	240.000	240.000	240.000	240.000	240.000
TITANIUM (UG/L)									
1991 FEB	12.000	6.800	7.000	7.800	7.900	7.800	7.900	7.200	7.200
1991 APR	12.000	7.700	8.600	9.500	8.000	9.500	8.000	8.800	8.800
1991 JUN	8.700	6.300	5.800	5.500	5.500	5.500	5.500	5.400	5.400
1991 AUG	3.200 <T	1.100 <T	1.500 <T	1.300 <T	1.300 <T	1.300 <T	1.300 <T	2.400 <T	2.400 <T
1991 OCT	5.500	2.600 <T	2.400 <T	2.800 <T	2.400 <T	2.800 <T	2.400 <T	2.400 <T	2.400 <T
1991 NOV	6.900	3.000 <T	3.200 <T	3.900 <T	3.900 <T	3.900 <T	3.900 <T	3.900 <T	3.900 <T
1992 FEB	10.000	7.600	5.500	6.300	6.300	6.300	6.300	6.300	6.300
1992 MAY	30.000	17.000	15.000	18.000	18.000	18.000	18.000	18.000	18.000
1992 JUN	20.000	8.600	8.900	8.700	8.700	8.700	8.700	8.700	8.700
1992 AUG	23.000	16.000	17.000	16.000	16.000	16.000	16.000	16.000	16.000
1992 OCT	7.000	5.300	5.100	5.500	5.500	5.500	5.500	5.500	5.500
1992 DEC	13.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000	11.000
THALLIUM (UG/L)									
1991 FEB	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 APR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
METALS					
URANIUM (UG/L)					
		DET'N LIMIT = 0.05		GUIDELINE = 100 (A1)	
1991 FEB	2.000	1.800	1.900	1.800	1.700
1991 APR	2.200	2.000	2.000	2.000	2.000
1991 JUN	2.300	2.400	2.600	2.600	2.300
1991 AUG	.940	.900	.870	.	.
1991 OCT	1.100	1.100	1.000	1.100	1.100
1991 NOV	1.600	1.800	1.900	.	.
1992 FEB	2.100	2.100	1.700	.	.
1992 MAY	2.000	1.60 <T	.460 <T	.	.
1992 JUN	1.900	2.300	2.400	.	.
1992 AUG	2.300	2.400	2.300	.	.
1992 OCT	2.200	2.600	2.400	.	.
1992 DEC	2.400	2.300	2.000	.	.
VANADIUM (UG/L)					
		DET'N LIMIT = 0.05		GUIDELINE = N/A	
1991 FEB	1.000	1.100	1.200	.790	.650
1991 APR	.760	1.100	1.400	.470 <T	.510
1991 JUN	1.600	1.200	1.300	.490 <T	.630
1991 AUG	1.500	2.500	1.800	.	.
1991 OCT	.860	.830	.930	.550	.430 <T
1991 NOV	.750	.670	1.100	.	.
1992 FEB	1.600	.840	1.100	.	.
1992 MAY	2.600	.380 <T	.560	.	.
1992 JUN	2.000	1.600	1.800	.	.
1992 AUG	1.800	2.100	2.000	.	.
1992 OCT	.980	.980	1.200	.	.
1992 DEC	.460 <T	.530	.770	.	.
ZINC (UG/L)					
		DET'N LIMIT = 0.20		GUIDELINE = 5000 (A3)	
1991 FEB	11.000	20.000	100.000	4.400	94.000
1991 APR	12.000	24.000	100.000	4.500	47.000
1991 JUN	13.000	18.000	39.000	.690 <T	37.000
1991 AUG	9.400	34.000	93.000	.	.
1991 OCT	9.400	4.100	36.000	2.700	50.000
1991 NOV	16.000	4.300	35.000	.	.
1992 FEB	25.000	3.600	41.000	.	.
1992 MAY	29.000	11.000	63.000	.	.
1992 JUN	18.000	3.200	17.000	.	.
1992 AUG	9.800	3.700	20.000	.	.
1992 OCT	5.700	7.900	14.000	.	.
1992 DEC	5.400	4.000	19.000	.	.



TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
CHLOROPAROMATICS					
HEXACHLOROBUTADIENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 450 (04)	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
123-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
1234-TETChLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
1235-TETChLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
124-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = 10000 (1)	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
1245-TETChLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 38000 (04)	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
135-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
HEXACHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 10 (C1)	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
CHLOROAROMATICS					
HEXACHLOROETHANE (NG/L )		DET'N LIMIT = 1,000		GUIDELINE = 1900 (D4)	
1991 FEB	BDL	BDL	BDL	BDL	BDL
1991 APR	BDL	3,000 <T	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL
OCTACHLOROSTYRENE (NG/L )		DET'N LIMIT = 1,000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
PENTACHLOROBENZENE (NG/L )		DET'N LIMIT = 1,000		GUIDELINE = 74000 (D4)	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
236-TRICHLOROTOLUENE (NG/L )		DET'N LIMIT = 5,000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
245-TRICHLOROTOLUENE (NG/L )		DET'N LIMIT = 5,000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
26A-TRICHLOROTOLUENE (NG/L )		DET'N LIMIT = 5,000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
CHLOROPHENOLS					
234-TRICHLOROPHENOL (NG/L )		DET'N LIMIT = 100.0		GUIDELINE = N/A	
8 SAMPLES	BDL				
234,5-TRICHLOROPHENOL (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A	
8 SAMPLES	BDL				
235,6-TRICHLOROPHENOL (NG/L )		DET'N LIMIT = 10.0		GUIDELINE = N/A	
8 SAMPLES	BDL				
245-TRICHLOROPHENOL (NG/L )		DET'N LIMIT = 100.0		GUIDELINE = 2600000 (04)	
8 SAMPLES	BDL				
246-TRICHLOROPHENOL (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = 5000 (A1)	
1991 JUN	BDL				
1991 AUG	115				
1991 NOV	BDL				
1992 JUN	BDL				
1992 OCT	BDL				
PENTACHLOROPHENOL (NG/L )		DET'N LIMIT = 10.00		GUIDELINE = 60000 (A1)	
8 SAMPLES	BDL				

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
PESTICIDES AND PCB					
ALORIN (NG/L)	)	DET'N LIMIT = 1.000		GUIDELINE = 700 (A1)	
31 SAMPLES	BDL	BDL		BDL	
ALPHA BHC (NG/L)	)	DET'N LIMIT = 1.000		GUIDELINE = 700 (G)	
31 SAMPLES	BDL	BDL		BDL	
BETA BHC (NG/L)	)	DET'N LIMIT = 1.00		GUIDELINE = 300 (G)	
31 SAMPLES	BDL	BDL		BDL	
LINDANE (GAMMA BHC) (NG/L)	)	DET'N LIMIT = 1.000		GUIDELINE = 4000 (A1)	
1991 FEB	BDL	BDL		BDL	
1991 APR	BDL	BDL		BDL	
1991 JUN	3.000 <T	3.000 <T		3.000 <T	
1991 AUG	1AW	1AW		1AW	
1991 OCT	1AW	1AW		1AW	
1991 NOV	BDL	BDL		BDL	
1991 DEC	1.000 <T	BDL		BDL	
1992 FEB	BDL	BDL		BDL	
1992 MAY	BDL	BDL		BDL	
1992 JUN	3.000 <T	BDL		BDL	
1992 AUG	BDL	4.000 <T		BDL	
1992 OCT	BDL	1.000 <T		BDL	
1992 DEC	BDL	BDL		BDL	
ALPHA CHLORDANE (NG/L)	)	DET'N LIMIT = 2.000		GUIDELINE = 7000 (A1)	
31 SAMPLES	BDL	BDL		BDL	
GAMMA CHLORDANE (NG/L)	)	DET'N LIMIT = 2.00		GUIDELINE = 7000 (A1)	
31 SAMPLES	BDL	BDL		BDL	
DIELDRIN (NG/L)	)	DET'N LIMIT = 2.00		GUIDELINE = 700 (A1)	
31 SAMPLES	BDL	BDL		BDL	
METHOXYCHLOR (NG/L)	)	DET'N LIMIT = 5.0		GUIDELINE = 900000 (A1)	
31 SAMPLES	BDL	BDL		BDL	
ENDOSULFAN 1 (NG/L)	)	DET'N LIMIT = 2.00		GUIDELINE = 74000 (06)	
31 SAMPLES	BDL	BDL		BDL	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
PESTICIDES AND PCB					
ENDOSULFAN II (NG/L )		DET'N LIMIT = 5.000		GUIDELINE = 74000 (04)	
31 SAMPLES	BDL	BDL			BDL
ENDRIN (NG/L )		DET'N LIMIT = 5.000		GUIDELINE = 1600 (03)	
31 SAMPLES	BDL	BDL			BDL
ENDOSULFAN SULPHATE (NG/L )		DET'N LIMIT = 5.00		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL			BDL
HEPTACHLOR EPOXIDE (NG/L )		DET'N LIMIT = 1.000		GUIDELINE = 3000 (A1)	
25 SAMPLES	BDL	BDL			BDL
HEPTACHLOR (NG/L )		DET'N LIMIT = 1.000		GUIDELINE = 3000 (A1)	
31 SAMPLES	BDL	BDL			BDL
MIREX (NG/L )		DET'N LIMIT = 5.000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL			BDL
OXYCHLORDANE (NG/L )		DET'N LIMIT = 2.000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL			BDL
O,P-DDT (NG/L )		DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)	
31 SAMPLES	BDL	BDL			BDL
PCB (NG/L )		DET'N LIMIT = 20.00		GUIDELINE = 3000 (A2)	
31 SAMPLES	BDL	BDL			BDL
P,P-DDD (NG/L )		DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)	
31 SAMPLES	BDL	BDL			BDL
P,P-DDE (NG/L )		DET'N LIMIT = 1.000		GUIDELINE = 30000 (A1)	
31 SAMPLES	BDL	BDL			BDL
P,P-DDT (NG/L )		DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)	
31 SAMPLES	BDL	BDL			BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
PESTICIDES AND PCB					
TOXAPHENE (NG/L)		DET'N LIMIT = 500.0		GUIDELINE = 5000 (A1)	
27 SAMPLES	BDL	BDL			BDL
AMETRINE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = 300000 (03)	
18 SAMPLES	BDL	BDL			
ATRAZINE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = 60000 (A2)	
1991 FEB	490,000 <T	510,000			
1991 APR	140,000 <T	115			
1991 JUN	3010,000	1NR			
1991 AUG	1AW	1AW			
1991 OCT	BDL	BDL			
1991 NOV	BDL	BDL			
1992 FEB	1SM	1SM			
1992 MAY	170,000 <T	130,000 <T			
1992 JUN	900,000	850,000			
1992 AUG	520,000	840,000			
1992 OCT	90,000 <T	80,000 <T			
1992 DEC	80,000 <T	90,000 <T			
ATRATONE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = N/A	
18 SAMPLES	BDL	BDL			
CYANAZINE (BLADEX) (NG/L)					
		DET'N LIMIT = 100.0		GUIDELINE = 10000 (A2)	
1991 FEB	BDL	BDL			
1991 APR	BDL	115			
1991 JUN	2000,000 <T	1NR			
1991 AUG	1AW	1AW			
1991 OCT	1QU	1QU			
1991 NOV	1QU	1QU			
1992 FEB	1SM	1SM			
1992 MAY	BDL	BDL			
1992 JUN	410,000 <T	360,000 <T			
1992 AUG	BDL	BDL			
1992 OCT	BDL	BDL			
1992 DEC	BDL	BDL			

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
PESTICIDES AND PCB					
DESETHYL ATRAZINE (NG/L )		DET'N LIMIT = 200.0		GUIDELINE = 60000 (A2)	
1991 FEB	230,000 <T	260,000 <T	IIS	.	.
1991 APR	BOL	BOL	INR	.	.
1991 JUN	460,000 <T	460,000 <T	IAR	.	.
1991 AUG	IAR	IAR	IAR	.	.
1991 OCT	IQU	IQU	IQU	.	.
1991 NOV	IQU	IQU	IQU	.	.
1992 FEB	ISM	ISM	ISM	.	.
1992 MAY	BOL	BOL	BOL	.	.
1992 JUN	BOL	BOL	BOL	.	.
1992 AUG	250,000 <T	380,000 <T	BOL	.	.
1992 OCT	BOL	BOL	BOL	.	.
1992 DEC	BOL	BOL	BOL	.	.
DESETHYL SIMAZINE (NG/L )		DET'N LIMIT = 200.0		GUIDELINE = 10000 (A2)	
16 SAMPLES	BOL	BOL	BOL	.	.
PROMETONE (NG/L )		DET'N LIMIT = 50,000		GUIDELINE = 52500 (D3)	
14 SAMPLES	BOL	BOL	BOL	.	.
PROPACINE (NG/L )		DET'N LIMIT = 50,000		GUIDELINE = 700000 (D3)	
14 SAMPLES	BOL	BOL	BOL	.	.
PROMETRYNE (NG/L )		DET'N LIMIT = 50,000		GUIDELINE = 1000 (A2)	
18 SAMPLES	BOL	BOL	BOL	.	.
METRIBUZIN (SENCOR) (NG/L )		DET'N LIMIT = 100.0		GUIDELINE = 80000 (A1)	
1991 FEB	BOL	BOL	BOL	.	.
1991 APR	BOL	BOL	IIS	.	.
1991 JUN	570,000 <T	570,000 <T	INR	.	.
1991 AUG	IAR	IAR	IAR	.	.
1991 OCT	IQU	IQU	IQU	.	.
1991 NOV	IQU	IQU	IQU	.	.
1992 FEB	ISM	ISM	ISM	.	.
1992 MAY	BOL	BOL	BOL	.	.
1992 JUN	570,000 <T	350,000 <T	BOL	.	.
1992 AUG	BOL	150,000 <T	BOL	.	.
1992 OCT	BOL	BOL	BOL	.	.
1992 DEC	BOL	BOL	BOL	.	.

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
PESTICIDES AND PCB					
SIMAZINE (NG/L)		DET'N LIMIT = 50.00		GUIDELINE = 10000 (A2)	
1991 FEB	BDL	BDL			
1991 APR	BDL	IIS			
1991 JUN	BDL	INR			
1991 AUG	IAM	IAM			
1991 OCT	IQU	IQU			
1991 NOV	IQU	IQU			
1992 FEB	ISM	ISM			
1992 MAY	BDL	BDL			
1992 JUN	50.000 <T	50.000 <T			
1992 AUG	BDL	BDL			
1992 OCT	BDL	BDL			
1992 DEC	BDL	BDL			
ALACHLOR (LASSO) (NG/L)		DET'N LIMIT = 500.0		GUIDELINE = 5000 (A2)	
14 SAMPLES	BDL	BDL			
METOLACHLOR (NG/L)					
1991 FEB	BDL	BDL			
1991 APR	BDL	IIS			
1991 JUN	4380.000 <T	INR			
1991 AUG	IAM	IAM			
1991 OCT	BDL	BDL			
1991 NOV	BDL	BDL			
1992 FEB	ISM	ISM			
1992 MAY	BDL	BDL			
1992 JUN	2890.000 <T	2830.000 <T			
1992 AUG	600.000 <T	1170.000 <T			
1992 OCT	BDL	BDL			
1992 DEC	BDL	BDL			



TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
PESTICIDES AND PCB					
HEXACHLOROCYCLOPENTADIEN (NG/L)		DET'N LIMIT = 5.00		GUIDELINE = 206000 (04)	
1991 FEB	BDL	19,000 <T	8,000 <T	10,000 <T	-
1991 APR	BDL	34,000 <T	67,000	16,000 <T	-
1991 JUN	10U	1AW	10U	10U	-
1991 AUG	1AW	1AW	1AW	1AW	-
1991 OCT	1AW	1AW	1AW	1AW	-
1991 NOV	BDL	50,000 <T	BDL	-	-
1992 FEB	10U	10U	10U	-	-
1992 MAY	10U	10U	10U	-	-
1992 JUN	10U	10U	10U	-	-
1992 AUG	10U	10U	10U	-	-
1992 OCT	10U	11S	10U	-	-
1992 DEC	10U	10U	10U	-	-

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST		DIST. SYSTEM MOONEY ST		DIST. SYSTEM RICHMOND ST		DIST. SYSTEM RICHMOND ST	
		FREE FLOW		STANDING		FREE FLOW		STANDING	
PHENOLICS (UG/L)		DET'N LIMIT =		0.2		GUIDELINE = N/A			
PHENOLICS									
1991 FEB	BDL	.400 <T							
1991 APR	BDL	.800 <T							
1991 JUN	.400 <T	.800 <T							
1991 AUG	BDL	BDL							
1991 OCT	.800 <T	2.800							
1991 NOV	.800 <T	.400 <T							
1992 FEB	.800 <T	BDL							
1992 MAY	BDL	BDL							
1992 JUN	.600 <T	BDL							
1992 AUG	BDL	BDL							
1992 OCT	BDL	BDL							
1992 DEC	BDL	.600 <T							

TABLE 4

## DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
POLYAROMATIC HYDROCARBONS					
PHENANTHRENE (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL		BDL	
ANTHRACENE (NG/L)		DET'N LIMIT = 1.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL		BDL	
FLUORANTHRENE (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = 42000 (D4)	
14 SAMPLES	BDL	BDL		BDL	
PYRENE (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL		BDL	
BENZO(A)ANTHRACENE (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL		BDL	
CHRYSENE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL		BDL	
DIMETH. BENZ(A)ANTHR (NG/L)		DET'N LIMIT = 5.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL		BDL	
BENZO(E) PYRENE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL		BDL	
BENZO(B) FLUORANTHEN (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL		BDL	
PERYLENE (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL		BDL	
BENZO(K) FLUORANTHEN (NG/L)		DET'N LIMIT = 1.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL		BDL	
BENZO(A) PYRENE (NG/L)		DET'N LIMIT = 5.0		GUIDELINE = 10 (A1)	
14 SAMPLES	BDL	BDL		BDL	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
POLYAROMATIC HYDROCARBONS					
BENZO(G,H,I) PERYLEN (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL		BDL	
DIBENZO(A,H) ANTHRAC (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL		BDL	
INDENO(1,2,3-C,D) PY (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL		BDL	
BENZO(B) CHRYSENE (NG/L)		DET'N LIMIT = 2.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL		BDL	
CORONENE (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL		BDL	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
SPECIFIC PESTICIDES					
TOXAPHENE (NG/L )		DET'N LIMIT = 500.0		GUIDELINE = 5000 (A1)	
4 SAMPLES	BDL	BDL	BDL	BDL	BDL
2,4,5-T (NG/L )		DET'N LIMIT = 50.0		GUIDELINE = 280000 (A1)	
8 SAMPLES	BDL	BDL	BDL	BDL	BDL
2,4-D (NG/L )		DET'N LIMIT = 100.0		GUIDELINE = 100000 (A1)	
1991 JUN	210,000 <T	INR	BDL	BDL	BDL
1991 AUG	115	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL
1992 JUN	390,000 <T	450,000 <T	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL
2,4-DB (NG/L )		DET'N LIMIT = 200.0		GUIDELINE = N/A	
8 SAMPLES	BDL	BDL	BDL	BDL	BDL
2,4-D PROPRIONIC ACID (NG/L )		DET'N LIMIT = 100.0		GUIDELINE = N/A	
1991 JUN	BDL	INR	BDL	BDL	BDL
1991 AUG	115	BDL	BDL	BDL	BDL
1991 NOV	BDL	170,000 <T	BDL	BDL	BDL
1992 JUN	300,000 <T	530,000 <T	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL
DICAMBA (NG/L )		DET'N LIMIT = 50.0		GUIDELINE = 120000 (A1)	
1991 JUN	1010,000	INR	BDL	BDL	BDL
1991 AUG	115	BDL	BDL	BDL	BDL
1991 NOV	100,000 <T	140,000 <T	BDL	BDL	BDL
1992 JUN	230,000 <T	260,000 <T	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL
2,4,5-TP (SILVEX) (NG/L )		DET'N LIMIT = 20.00		GUIDELINE = 10000 (A1)	
8 SAMPLES	BDL	BDL	BDL	BDL	BDL
DIAZINON (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = 20000 (A1)	
5 SAMPLES	BDL	BDL	BDL	BDL	BDL
DICHLOROVOS (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A	
5 SAMPLES	BDL	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
SPECIFIC PESTICIDES					
CHLORPYRIFOS (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A	
5 SAMPLES	BDL				
ETHION (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = 35000 (G)	
5 SAMPLES	BDL				
MALATHION (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = 190000 (A1)	
5 SAMPLES	BDL				
MEVINPHOS (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A	
5 SAMPLES	BDL				
METHYL PARATHION (NG/L )		DET'N LIMIT = 50.0		GUIDELINE = 9000 (D3)	
5 SAMPLES	BDL				
METHYLTRITHION (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A	
5 SAMPLES	BDL				
PARATHION (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = 50000 (A1)	
5 SAMPLES	BDL				
PHORATE (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = 2000 (A2)	
5 SAMPLES	BDL				
RELDAN (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A	
5 SAMPLES	BDL				
RONNEL (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A	
5 SAMPLES	BDL				
CARBOFURAN (NG/L )		DET'N LIMIT = 2000.0		GUIDELINE = 90000 (A1)	
7 SAMPLES	BDL				
CHLOROPHAPH (CIPC) (NG/L )		DET'N LIMIT = 2000.0		GUIDELINE = 350000 (G)	
7 SAMPLES	BDL				

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
SPECIFIC PESTICIDES					
DIALATE (NG/L )		DET'N LIMIT = 2000.0		GUIDELINE = N/A	
7 SAMPLES	BDL				
EPTAM (NG/L )		DET'N LIMIT = 2000.0		GUIDELINE = N/A	
7 SAMPLES	BDL				
IPC (NG/L )		DET'N LIMIT = 2000.0		GUIDELINE = N/A	
7 SAMPLES	BDL				
PROPOXUR (NG/L )		DET'N LIMIT = 2000.0		GUIDELINE = 140000 (D3)	
7 SAMPLES	BDL				
CARBARYL (NG/L )		DET'N LIMIT = 200.0		GUIDELINE = 90000 (A1)	
7 SAMPLES	BDL				
BUTYLATE (NG/L )		DET'N LIMIT = 2000.0		GUIDELINE = 245000 (D3)	
7 SAMPLES	BDL				

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED		DIST. SYSTEM MOONEY ST FREE FLOW		DIST. SYSTEM MOONEY ST STANDING		DIST. SYSTEM RICHMOND ST FREE FLOW		DIST. SYSTEM RICHMOND ST STANDING	
VOLATILES											
BENZENE (UG/L )		BDL	BDL	BDL	BDL	DET'N LIMIT = 0.05 GUIDELINE = 5 (A1)					
40 SAMPLES		BDL	BDL	BDL	BDL	BDL					
TOLUENE (UG/L )		BDL	BDL	BDL	BDL	DET'N LIMIT = 0.05 GUIDELINE = 24 (A3)					
1991 FEB	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 APR	BDL	BDL	BDL	BDL	BDL	.150 <T	BDL	BDL	.050 <T	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL	.250 <T	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL	.050 <T	BDL	BDL	BDL	BDL	BDL
1992 FEB	.050 <T	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL	.050 <T	BDL	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL	.100 <T	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ETHYLBENZENE (UG/L )		BDL	BDL	BDL	BDL	DET'N LIMIT = 0.05 GUIDELINE = 2.4 (A3)					
1991 FEB	.100 <T	BDL	BDL	BDL	BDL	.050 <T	BDL	BDL	.050 <T	BDL	BDL
1991 APR	BDL	BDL	BDL	BDL	BDL	.050 <T	BDL	BDL	.050 <T	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL	.050 <T	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL	.100 <T	BDL	BDL	BDL	BDL	BDL
1991 OCT	.100 <T	BDL	BDL	BDL	BDL	.050 <T	BDL	BDL	.100 <T	BDL	BDL
1991 NOV	.100 <T	BDL	BDL	BDL	BDL	.100 <T	BDL	BDL	BDL	BDL	BDL
1992 FEB	.050 <T	BDL	BDL	BDL	BDL	.100 <T	BDL	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL	BDL	BDL	.100 <T	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL	.100 <T	BDL	BDL	BDL	BDL	BDL
1992 AUG	.100 <T	BDL	BDL	BDL	BDL	.150 <T	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL	.100 <T	BDL	BDL	BDL	BDL	BDL
1992 DEC	.150 <T	BDL	BDL	BDL	BDL	.200 <T	BDL	BDL	BDL	BDL	BDL
P-XYLENE (UG/L )		BDL	BDL	BDL	BDL	DET'N LIMIT = 0.10 GUIDELINE = 300 (A3*)					
40 SAMPLES		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL



TABLE 4

## DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
VOLATILES					
M-XYLENE (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 300 (A3*)	
1991 FEB	BDL	BDL	BDL	BDL	BDL
1991 APR	BDL	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL
O-XYLENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 300 (A3*)	
1991 FEB	BDL	BDL	BDL	BDL	BDL
1991 APR	BDL	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL
STYRENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 100 (D1)	
1991 FEB	.150 <T	.050 <T	.150 <T	.100 <T	.100 <T
1991 APR	BDL	.050 <T	.050 <T	BDL	BDL
1991 JUN	BDL	.100 <T	.100 <T	BDL	BDL
1991 AUG	BDL	.200 <T	.050 <T	.200 <T	.200 <T
1991 OCT	.150 <T	.150 <T	.150 <T	.200 <T	.200 <T
1991 NOV	.100 <T	.200 <T	.200 <T	.250 <T	.250 <T
1992 FEB	.200 <T	.200 <T	.200 <T	.250 <T	.250 <T
1992 MAY	.050 <T	.250 <T	.200 <T	.200 <T	.200 <T
1992 JUN	BDL	.200 <T	.200 <T	.300 <T	.300 <T
1992 AUG	.050 <T	BDL	.100 <T	.100 <T	.100 <T
1992 OCT	BDL	.150 <T	.250 <T	.250 <T	.250 <T
1992 DEC	.200 <T	.150 <T	.250 <T	.250 <T	.250 <T
1,1-DICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.100		GUIDELINE = 7 (D1)	
40 SAMPLES	BDL	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
VOLATILES					
METHYLENE CHLORIDE (UG/L)		DET'N LIMIT = 0.50		GUIDELINE = 50 (A1)	
40 SAMPLES	BDL	BDL			BDL
T12-DICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 70 (D1)	
40 SAMPLES	BDL	BDL			BDL
1,1-DICHLOROETHANE (UG/L)		DET'N LIMIT = 0.100		GUIDELINE = N/A	
40 SAMPLES	BDL	BDL			BDL
CHLOROFORM (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 350 (A1+)	
1991 FEB	BDL	28.300			22.400
1991 APR	BDL	56.000			44.200
1991 JUN	BDL	74.000			55.600
1991 AUG	BDL	50.700			
1991 OCT	BDL	44.100			32.900
1991 NOV	BDL	47.100			
1992 FEB	BDL	26.000			
1992 MAY	BDL	41.800			
1992 JUN	BDL	49.200			
1992 AUG	BDL	64.500			
1992 OCT	BDL	69.300			
1992 DEC	BDL	44.700			
11,11,TRICHLOROETHANE (UG/L)		DET'N LIMIT = 0.02		GUIDELINE = 200 (D1)	
1991 FEB	BDL	BDL			BDL
1991 APR	BDL	BDL			BDL
1991 JUN	BDL	BDL			BDL
1991 AUG	BDL	0.060 <T			
1991 OCT	BDL	BDL			BDL
1991 NOV	BDL	BDL			
1992 FEB	BDL	BDL			
1992 MAY	BDL	BDL			
1992 JUN	BDL	BDL			
1992 AUG	BDL	BDL			
1992 OCT	BDL	BDL			
1992 DEC	BDL	BDL			
1,2 DICHLOROETHANE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 5 (A1)	
40 SAMPLES	BDL	BDL			BDL

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
VOLATILES					
CARBON TETRACHLORIDE (UG/L)		DET'N LIMIT = 0.20		GUIDELINE = 5 (A1)	
40 SAMPLES	BDL	BDL			BDL
1,2-DICHLOROPROPANE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 5 (D1)	
40 SAMPLES	BDL	BDL			BDL
TRICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 50 (A1)	
1991 FEB	BDL	BDL			BDL
1991 APR	BDL	BDL			BDL
1991 JUN	BDL	BDL			BDL
1991 AUG	BDL	BDL			BDL
1991 OCT	BDL	BDL			BDL
1991 NOV	BDL	BDL			BDL
1992 FEB	BDL	BDL			BDL
1992 MAY	BDL	BDL			BDL
1992 JUN	BDL	BDL			BDL
1992 AUG	BDL	BDL			BDL
1992 OCT	BDL	BDL			BDL
1992 DEC	BDL	BDL			BDL
DICHLOBROMOMETHANE (UG/L)					
		DET'N LIMIT = 0.05		GUIDELINE = 350 (A1+)	
1991 FEB	BDL	10.000			7.400
1991 APR	BDL	15.750			12.750
1991 JUN	BDL	19.100			15.300
1991 AUG	BDL	17.650			
1991 OCT	BDL	14.450			11.250
1991 NOV	BDL	14.000			
1992 FEB	BDL	13.100			
1992 MAY	BDL	11.800			
1992 JUN	BDL	16.700			
1992 AUG	BDL	18.550			
1992 OCT	BDL	19.850			
1992 DEC	BDL	17.150			
112-TRICHLOROETHANE (UG/L)					
		DET'N LIMIT = 0.05		GUIDELINE = 0.6 (D4)	
40 SAMPLES	BDL	BDL			BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	MOONEY ST FREE FLOW	MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
VOLATILES					
CHLORODIBROMOMETHANE (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 350 (A1+)	
1991 FEB	BDL	1,600	1,100	1,300	
1991 APR	BDL	3,300	2,900	2,500	
1991 JUN	BDL	2,900	2,700 APS	2,400	
1991 AUG	BDL	3,500	2,900		
1991 OCT	BDL	2,300	1,800	1,800	
1991 NOV	BDL	2,300	2,000		
1991 DEC	BDL	3,000	2,600		
1992 FEB	BDL	1,500	1,300		
1992 MAY	BDL	3,400	3,200		
1992 JUN	BDL	3,100	3,300		
1992 AUG	BDL	3,400	3,500		
1992 OCT	BDL	3,200			
1992 DEC	BDL				
TETRACHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 65 (A5)	
40 SAMPLES	BDL	BDL	BDL	BDL	
BROMOFORM (UG/L)		DET'N LIMIT = 0.20		GUIDELINE = 350 (A1+)	
40 SAMPLES	BDL	BDL	BDL	BDL	
1,1,2,2-TETRACHLOROETHANE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 0.17 (O4)	
40 SAMPLES	BDL	BDL	BDL	BDL	
VINYL CHLORIDE (UG/L)		DET'N LIMIT = 0.100		GUIDELINE = 2 (O1)	
18 SAMPLES	BDL	BDL	BDL		
C12-DICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.100		GUIDELINE = 70 (O1)	
18 SAMPLES	BDL	BDL	BDL		
CHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 1510 (O3)	
40 SAMPLES	BDL	BDL	BDL	BDL	
1,4-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 5 (A1)	
40 SAMPLES	BDL	BDL	BDL	BDL	
1,3-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 3750 (O3)	
40 SAMPLES	BDL	BDL	BDL	BDL	

TABLE 4

## DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
VOLATILES					
1,2-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 200 (A1)	
40 SAMPLES	BDL	BDL		BDL	
ETHYLENE DIBROMIDE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 50 (D1)	
40 SAMPLES	BDL	BDL		BDL	
TOTL TRIHALOMETHANES (UG/L)		DET'N LIMIT = 0.50		GUIDELINE = 350 (A1)	
1991 FEB	BDL	39,800	29,450		
1991 APR	BDL	73,000	64,950	31,150	
1991 JUN	BDL	96,000	67,500	59,450	
1991 AUG	BDL	71,850	55,800	73,300	
1991 OCT	BDL	60,850	50,300		
1991 NOV	BDL	63,400	51,000	45,950	
1992 FEB	BDL	42,100	35,000		
1992 MAY	BDL	55,100	20,900		
1992 JUN	BDL	69,300	68,050		
1992 AUG	BDL	86,150	117,650		
1992 OCT	BDL	92,550	76,300		
1992 DEC	BDL	65,050	51,300		

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM, 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
RADIONUCLIDES					
COBALT 60 (BQ/L)		DET'N LIMIT = 0.70		GUIDELINE = N/A	
8 SAMPLES	BDL	BDL	.	.	.
CESIUM 134 (BQ/L)		DET'N LIMIT = 0.70		GUIDELINE = N/A	
8 SAMPLES	BDL	.	.	.	.
CESIUM 137 (BQ/L)		DET'N LIMIT = 0.70		GUIDELINE = 50 (A1)	
8 SAMPLES	BDL	.	.	.	.
GROSS ALPHA COUNT (BQ/L)		DET'N LIMIT = 0.04		GUIDELINE = 0.55 (D1)	
1991 FEB	.100	.	.	.	.
1991 JUN	BDL	.	.	.	.
1991 AUG	BDL	.	.	.	.
1992 MAY	.460	.	.	.	.
GROSS BETA COUNT (BQ/L)		DET'N LIMIT = 0.04		GUIDELINE = N/A	
1991 FEB	.230	.	.	.	.
1991 JUN	.180	.	.	.	.
1991 AUG	.110	.	.	.	.
1992 MAY	.860	.	.	.	.
TRITIUM (BQ/L)		DET'N LIMIT = 7.00		GUIDELINE = 40000 (A1)	
1991 FEB	9.000	.	.	.	.
1991 JUN	10.000	BDL	.	.	.
1991 AUG	BDL	12.000	.	.	.
1992 MAY	BDL	BDL	.	.	.
IODINE 131 (BQ/L)		DET'N LIMIT = 0.70		GUIDELINE = 10 (A1)	
8 SAMPLES	BDL	.	.	.	.

TABLE 5  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BACTERIOLOGICAL			
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0 (A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML (A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML (A1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A
FIELD PH	DMNSLESS	N/A	6.5-8.5 (A4)
FIELD TEMPERATURE	DEG.C	N/A	15.0 (A3)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	0.20	30-500 (A4)
AMMONIUM TOTAL	MG/L	0.002	0.05 (F2)
CALCIUM	MG/L	0.20	100.0 (F2)
CHLORIDE	MG/L	0.20	250.0 (A3)
COLOUR	TCU	0.50	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.00	400.0 (F2)
CYANIDE	MG/L	0.001	0.2 (A1)
DISSOLVED ORGANIC CARBON	MG/L	0.10	5.0 (A3)
FLUORIDE	MG/L	0.01	1.5* (A1)
HARDNESS	MG/L	0.50	80-100 (A4)
IONCAL	DMNSLESS	N/A	N/A
LANGELIERS INDEX	DMNSLESS	N/A	N/A
MAGNESIUM	MG/L	0.10	30.0 (F2)
NITRATES (TOTAL)	MG/L	0.005	10.0 (A1)
NITRITE	MG/L	0.001	1.0 (A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A
PH	DMNSLESS	N/A	6.5-8.5 (A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A
PHOSPHORUS TOTAL	MG/L	0.002	0.4 (F2)
POTASSIUM	MG/L	0.010	10.0 (F2)
RESIDUE FILTRATE (CALCULATED TDS)	MG/L	N/A	500.0 (A3)
SODIUM	MG/L	0.20	200.0 (A4)
SULPHATE	MG/L	0.20	500.0 (A4)
TURBIDITY	FTU	0.05	1.0 (A1)
* The Maximum Acceptable Concentration (MAC) for <u>naturally occurring fluoride</u> in drinking water is 2.4 mg/L.			
CHLOROAROMATICS			
1,2,3-TRICHLOROBENZENE	NG/L	5.0	N/A
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,4-TRICHLOROBENZENE	NG/L	5.0	10000 (I)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.0	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.0	N/A
2,3,6-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,6A-TRICHLOROTOLUENE	NG/L	5.0	N/A
HEXACHLOROBENZENE (HCB)	NG/L	1.0	10 (C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450 (D4)
HEXACHLOROETHANE	NG/L	1.0	1900 (D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A
PENTACHLOROBENZENE	NG/L	1.0	74000 (D4)
CHLOROPHENOLS			
2,3,4-TRICHLOROPHENOL	NG/L	100.0	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	20.0	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	10.0	N/A

TABLE 5  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
2,4,5-TRICHLOROPHENOL	NG/L	100.0	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	20.0	5000 (A1)
PENTACHLOROPHENOL	NG/L	10.0	60000 (A1)
METALS			
ALUMINUM	UG/L	0.10	100 (A4)
ANTIMONY	UG/L	0.05	146 (D4)
ARSENIC	UG/L	0.10	25 (A1)
BARIUM	UG/L	0.05	1000 (A2)
BERYLLIUM	UG/L	0.05	6800 (D4)
BORON	UG/L	2.00	5000 (A1)
CADMIUM	UG/L	0.05	5 (A1)
CHROMIUM	UG/L	0.50	50 (A1)
COBALT	UG/L	0.02	N/A
COPPER	UG/L	0.50	1000 (A3)
IRON	UG/L	6.00	300 (A3)
LEAD	UG/L	0.05	10 (A1)
MANGANESE	UG/L	0.05	50 (A3)
MERCURY	UG/L	0.02	1 (A1)
MOLYBDENUM	UG/L	0.05	N/A
NICKEL	UG/L	0.20	350 (D3)
SELENIUM	UG/L	1.00	10 (A1)
SILVER	UG/L	0.05	N/A
STRONTIUM	UG/L	0.10	N/A
THALLIUM	UG/L	0.05	13 (D4)
TITANIUM	UG/L	0.50	N/A
URANIUM	UG/L	0.05	100 (A1)
VANADIUM	UG/L	0.05	N/A
ZINC	UG/L	0.20	5000 (A3)
POLYNUCLEAR AROMATIC HYDROCARBONS			
ANTHRACENE	NG/L	1.0	N/A
BENZO(A) ANTHRACENE	NG/L	20.0	N/A
BENZO(A) PYRENE	NG/L	5.0	10 (A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A
BENZO(E) PYRENE	NG/L	50.0	N/A
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A
CHRYSENE	NG/L	50.0	N/A
CORONENE	NG/L	10.0	N/A
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A
FLUORANTHENE	NG/L	20.0	42000 (D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A
PERYLENE	NG/L	10.0	N/A
PHENANTHRENE	NG/L	10.0	N/A
PYRENE	NG/L	20.0	N/A
PESTICIDES & PCB			
ALACHLOR (LASSO)	NG/L	500.0	5000 (A2)
ALDRIN	NG/L	1.0	700 (A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700 (G)
ALPHA CHLORDANE	NG/L	2.0	7000 (A1)
AMETRINE	NG/L	50.0	300000 (D3)
ATRATONE	NG/L	50.0	N/A
ATRAZINE	NG/L	50.0	60000 (A2)
DESETHYL ATRAZINE	NG/L	200.0	60000 (A2)
BETA, HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300 (G)
CYANAZINE (BLADEX)	NG/L	100.0	10000 (A2)
DIELDRIN	NG/L	2.0	700 (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000 (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000 (D4)
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A



TABLE 5  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
ENDRIN	NG/L	5.0	1600 (D3)
GAMMA CHLORDANE	NG/L	2.0	7000 (A1)
HEPTACHLOR	NG/L	1.0	3000 (A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000 (A1)
HEXACHLOROCYCLOPENTADIENE	NG/L	5.0	206000 (D4)
LINDANE (GAMMA BHC)	NG/L	1.0	4000 (A1)
METHOXYCHLOR	NG/L	5.0	900000 (A1)
METOLACHLOR	NG/L	500.0	50000 (A2)
METRIBUZIN (SENCOR)	NG/L	100.0	80000 (A1)
MIREX	NG/L	5.0	N/A
P,P-DDD	NG/L	5.0	30000 (A1)
O,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDE	NG/L	1.0	30000 (A1)
OXYCHLORDANE	NG/L	2.0	N/A
PCB	NG/L	20.0	3000 (A2)
PROMETONE	NG/L	50.0	52500 (D3)
PROMETRYNE	NG/L	50.0	1000 (A2)
PROPAZINE	NG/L	50.0	700000 (D3)
SIMAZINE	NG/L	50.0	10000 (A2)
DESETHYL SIMAZINE	NG/L	200.0	10000 (A2)
TOXAPHENE	NG/L	500.0	5000 (A1)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	N/A
SPECIFIC PESTICIDES			
2,4 D PROPIONIC ACID	NG/L	100.0	N/A
2,4,5-TRICHLOROPHOXY ACETIC ACID	NG/L	50.0	280000 (A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.0	100000 (A1)
2,4-DICHLOROPHOXYBUTYRIC ACID (2,4-DB)	NG/L	200.0	N/A
2,4,5-TP (SILVEX)	NG/L	20.0	10000 (A1)
BUTYLATE (SUTAN)	NG/L	2000.0	245000 (D3)
CARBARYL (SEVIN)	NG/L	200.0	90000 (A1)
CARBOFURAN	NG/L	2000.0	90000 (A1)
CHLOROPHAM (CIPC)	NG/L	2000.0	350000 (G)
CHLORPYRIFOS (DURSBAN)	NG/L	20.0	N/A
DIALATE	NG/L	2000.0	N/A
DIAZINON	NG/L	20.0	20000 (A1)
DICAMBA	NG/L	50.0	120000 (A1)
DICHLOROVOS	NG/L	20.0	N/A
EPTAM	NG/L	2000.0	N/A
ETHION	NG/L	20.0	35000 (G)
IPC	NG/L	2000.0	N/A
MALATHION	NG/L	20.0	190000 (A1)
METHYL PARATHION	NG/L	50.0	9000 (D3)
METHYLTRITHION	NG/L	20.0	N/A
MEVINPHOS	NG/L	20.0	N/A
PARATHION	NG/L	20.0	50000 (A1)
PHORATE (THIMET)	NG/L	20.0	2000 (A2)
PICHLORAM	NG/L	100.0	190000 (A2)
PROPOXUR (BAYGON)	NG/L	2000.0	140000 (D3)
RELDAN	NG/L	20.0	N/A
RONNEL	NG/L	20.0	N/A
VOLATILES			
1,1-DICHLOROETHANE	UG/L	0.10	N/A
1,1-DICHLOROETHYLENE	UG/L	0.10	7 (D1)
1,2-DICHLOROBENZENE	UG/L	0.05	200 (A1)
1,2-DICHLOROETHANE	UG/L	0.05	5 (A1)
1,2-DICHLOROPROPANE	UG/L	0.05	5 (D1)
1,3-DICHLOROBENZENE	UG/L	0.10	3750 (D3)
1,4-DICHLOROBENZENE	UG/L	0.10	5 (A1)
1,1,1-TRICHLOROETHANE	UG/L	0.02	200 (D1)
1,1,2-TRICHLOROETHANE	UG/L	0.05	0.6 (D4)
1,1,2,2-TETRACHLOROETHANE	UG/L	0.05	0.17 (D4)

TABLE 5  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BENZENE	UG/L	0.05	5 (A1)
BROMOFORM	UG/L	0.20	350 (A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5 (A1)
CHLOROBENZENE	UG/L	0.10	1510 (D3)
CHLORODIBROMOMETHANE	UG/L	0.10	350 (A1+)
CHLOROFORM	UG/L	0.10	350 (A1+)
CIS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
DICHLOROBROMOMETHANE	UG/L	0.05	350 (A1+)
ETHYLENE DIBROMIDE	UG/L	0.05	50 (D1)
ETHYLBENZENE	UG/L	0.05	2.4 (A3)
M-XYLENE	UG/L	0.10	300 (A3*)
METHYLENE CHLORIDE	UG/L	0.50	50 (A1)
O-XYLENE	UG/L	0.05	300 (A3*)
P-XYLENE	UG/L	0.10	300 (A3*)
STYRENE	UG/L	0.05	100 (D1)
TETRACHLOROETHYLENE	UG/L	0.05	65 (A5)
TRANS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
TOLUENE	UG/L	0.05	24 (A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350 (A1)
TRICHLOROETHYLENE	UG/L	0.10	50 (A1)
VINYL CHLORIDE	UG/L	0.10	2 (D1)
RADIONUCLIDES			
TRITIUM	BQ/L	7.0	40000 (A1)
GROSS ALPHA COUNT	BQ/L	0.04	0.55# (D1)
GROSS BETA COUNT	BQ/L	0.04	N/A
COBALT 60	BQ/L	0.70	N/A
CESIUM 134	BQ/L	0.70	N/A
CESIUM 137	BQ/L	0.70	50 (A1)
IODINE 131	BQ/L	0.70	10 (A1)

# Equal to 15.0 Picocuries/litre

DRINKING WATER SURVEILLANCE PROGRAM  
PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored.

The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1992, 109 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment and Energy (MOEE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

## DATA REPORTING MECHANISM

When the analytical results are transferred from the MOEE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOEE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

## PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

### Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

#### 1. PROCESS COMPONENT INVENTORY

All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

#### 2. TREATMENT CHEMICALS

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

#### 3. PROCESS CONTROL MEASUREMENTS

Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

#### 4. DESIGN FLOW AND RETENTION TIME

Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

#### 5. DISTRIBUTION SYSTEM DESCRIPTION

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

## 6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

- i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;
- ii/ the water being sampled is not being modified by the sampling system;
- iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and
- iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap); pump characteristics (model, type, capacity); and flow rate.

## 7. PERSONNEL

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOEE personnel associated with the plant.

### Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

### Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.



Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

#### Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

#### Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOEE offices is being developed by the DWSP group.

#### Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOEE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

#### Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOEE Regional needs and to respond to public requests.

#### Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

## PARAMETER REFERENCE INFORMATION

NAME:	BENZENE
CAS#:	71-43-2
MOLECULAR FORMULAE:	$C_6H_6$
DETECTION LIMIT:	(FOR METHOD POCODO) 0.05 $\mu g/L$
SYNONYMS:	BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27) CYCLOHEXATRIENE (41)
CHARACTERISTICS:	COLOURLESS TO LIGHT-YELLOW, MOBILE, NONPOLAR LIQUID, OF HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN WITH SMOKING FLAME (30)
PROPERTIES:	SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41) THRESHOLD ODOUR: 0.5 - 10 PPM IN WATER THRESHOLD TASTE: 0.5 mg/L IN WATER (39) ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES, SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM SOILS OR ARE DEGRADED RATHER QUICKLY (80)
SOURCES:	COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES; COMBUSTION OF CAR EXHAUST. ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.
USES:	DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF OTHER COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING AGENT; GASOLINE.
REMOVAL:	THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION, COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION, OXIDATION
ADDITIONAL PROPERTIES:	MOLECULAR WEIGHT: 78.12 MELTING POINT: 5.5°C (27) BOILING POINT: 80.1°C (27) SPECIFIC GRAVITY: 0.8790 AT 20°C (27) VAPOUR PRESSURE: 100 MM AT 26.1°C (27) HENRY'S LAW CONSTANT: 0.00555 ATM-M <sup>3</sup> /MOLE (41) LOG OCT./WATER PARTITION COEFFICIENT: 1.95 TO 2.13 (39) CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41) SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA

DWSP SAMPLING GUIDELINE

i) Raw and Treated at Plant

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-220 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid ( $\text{HNO}_3$ ) (Caution: $\text{HNO}_3$ is corrosive)
Volatiles (duplicates) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle -fill bottle completely without bubbles
Organics (OWOC), (OWTRI)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Specific Pesticides (OWCP), (PEOP), (PECAR)	-as per Organics -three extra bottles must be filled.
Polyaromatic hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate
Cyanide (Treated only)	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops sodium hydroxide ( $\text{NaOH}$ ) (Caution: $\text{NaOH}$ is corrosive)
Mercury	-250 mL glass bottle -rinse bottle and cap three times -fill to top of label -add 20 drops each nitric acid ( $\text{HNO}_3$ ) and potassium dichromate ( $\text{K}_2\text{Cr}_2\text{O}_7$ ) (Caution: $\text{HNO}_3$ & $\text{K}_2\text{Cr}_2\text{O}_7$ are corrosive)



Phenols	-250 mL glass bottle -do <u>not</u> rinse bottle, preservative has been added -fill to top of label
Radionuclides (as scheduled)	-4 L plastic jug -do <u>not</u> rinse, carrier added -fill to 5 cm from top
Organic Characterization (GC/MS - once per year) (PBVOL), (PBEXT)	-1 L amber glass bottle; instructions as per organic -250 mL glass bottle -do <u>not</u> rinse bottle -fill completely without bubbles

Steps:

1. Let sampling water tap run for an adequate time to clear the sample line.
2. Record time of day on submission sheet.
3. Record temperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.
6. No smoking in area of sample location.

ii) Distribution Samples (standing water)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid ( $\text{HNO}_3$ ) (Caution: $\text{HNO}_3$ is corrosive)

Steps:

1. Record time of day on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.

5. Fill general chemistry and metals bottles.

6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-250 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid $\text{HNO}_3$ (Caution: $\text{HNO}_3$ is corrosive)
Volatiles (duplicate) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle, preservative has been added -fill bottle completely without bubbles
Organics (OWOC)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Polyaromatic Hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate

Steps:

1. Record time of day on submission sheet.

2. Let cold water flow for five minutes.

3. Record temperature on submission sheet.

4. Fill all bottles as per instructions.

5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.



